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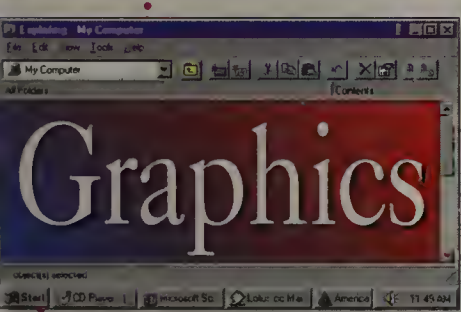

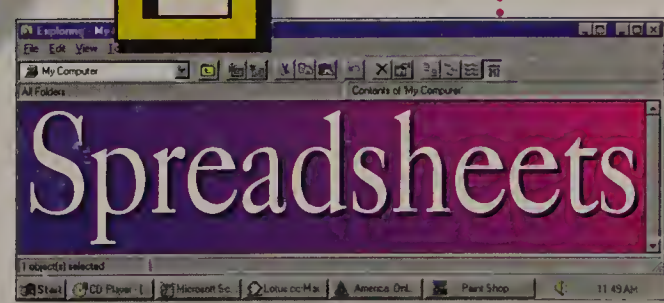

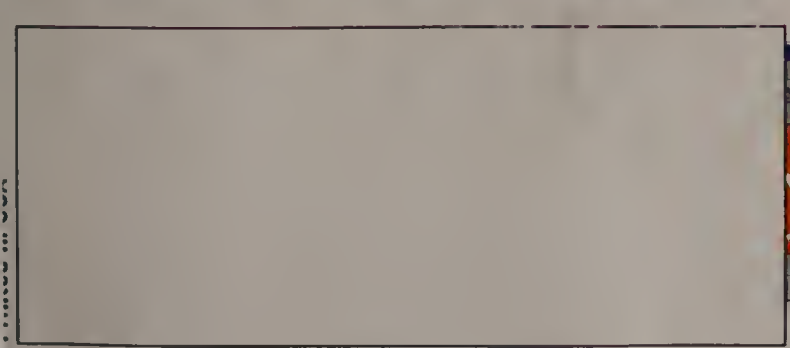

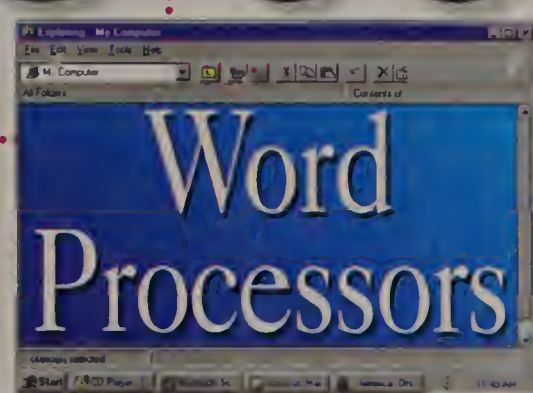

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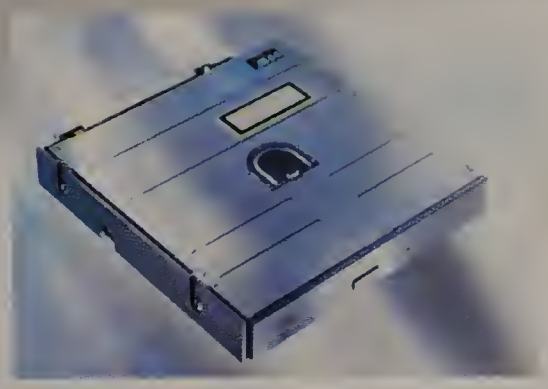
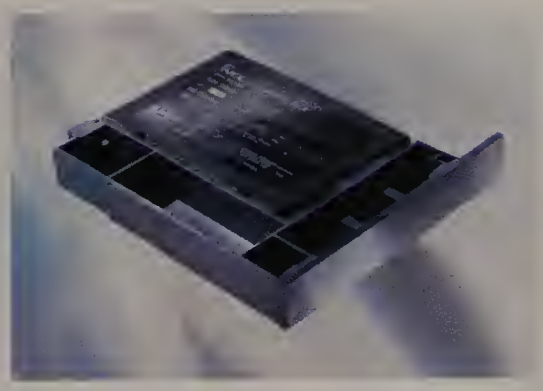
Designed for Microsoft® Windows® 95

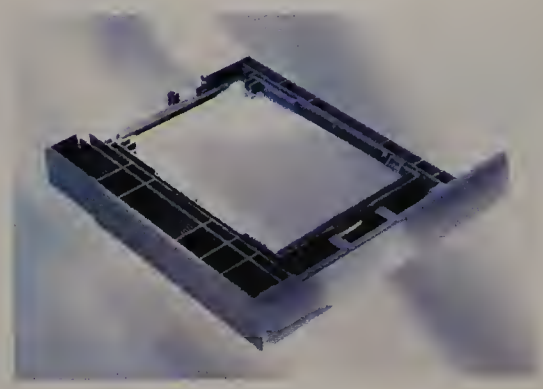
New VersaBay™ II technology lets you configure the Versa® 4000 at a moment's notice. Need multimedia? Just slip in the CD-ROM drive.



Want enough power to work through a coast-to-coast flight? Just slip in a second state-of-the-art lithium-ion battery.



Need additional storage? You're in luck. The VersaBay II lets you easily snap in a second hard drive.



And, thanks to the VersaBay II, all you have to do is insert the 1.44MB floppy disk drive for software and document installation.

Introducing the Versa® 4000 from NEC. The company that introduced the concept of modularity to notebook computing brings you the next generation in notebook versatility. Along with its innovative VersaBay II, the Versa 4000 features a brilliant 10.4" high-resolution screen, full-motion video support, SoundBlaster™ Pro compatibility, two built-in speakers and a microphone. So what do you get when you combine all that with its 90MHz Pentium® processor, 810MB HDD, 8–40MB RAM, a lithium-ion battery, a VersaGlide™ pointing device and hot-swappable PCMCIA? Simple. Not just the most advanced notebook for multimedia, the most advanced notebook, period. Call 1-800-NEC-VERSA.

intel inside pentium processor

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AND TIMES

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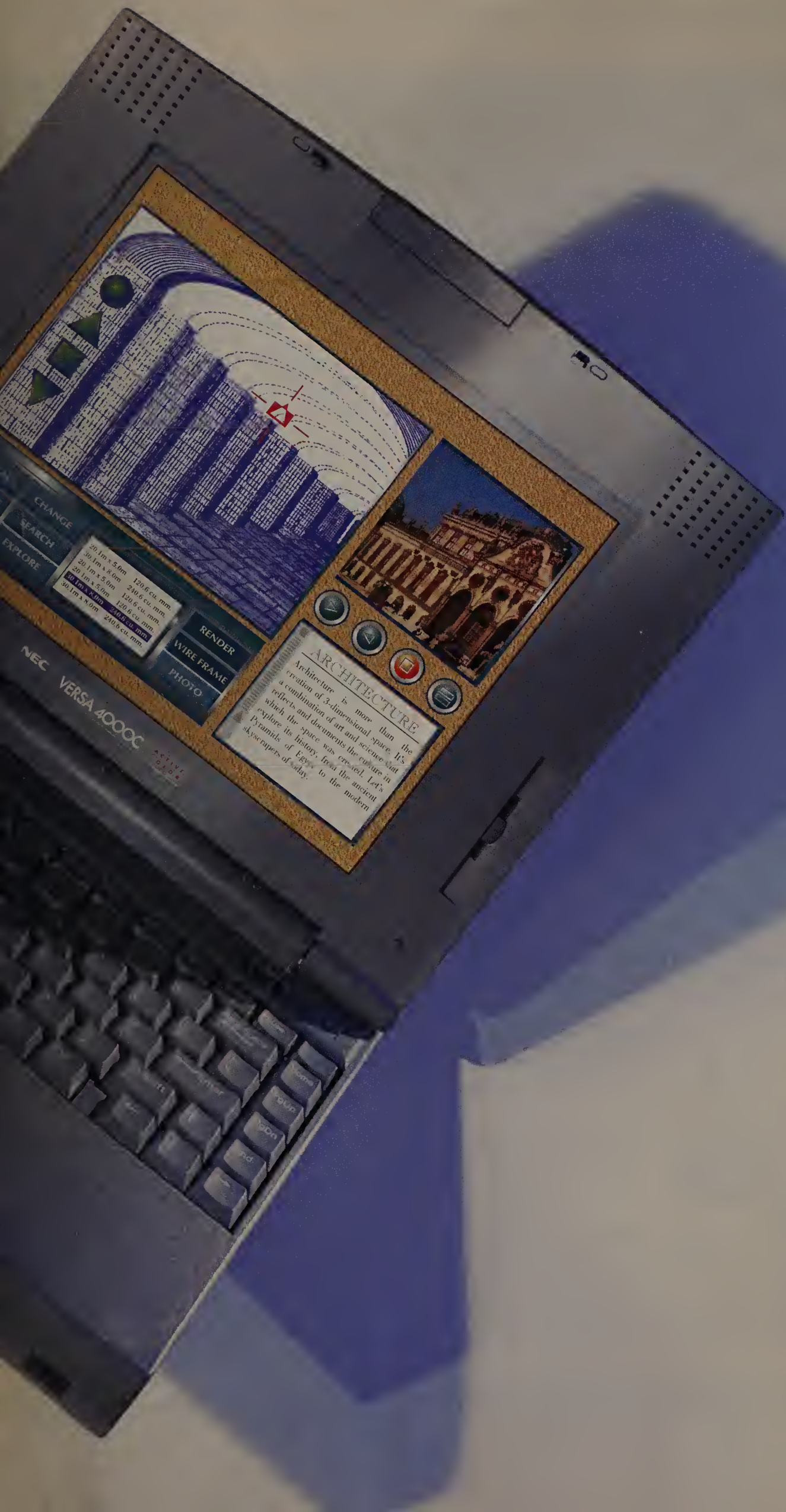

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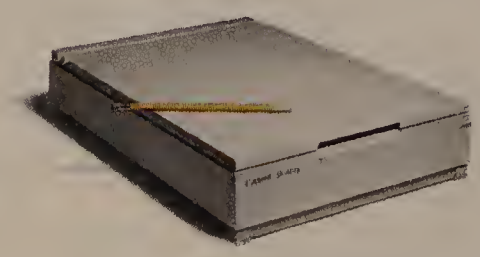
that's *really* just an



The Canon® IX-4015 is the smallest flatbed color scanner there is. But even though it can fit in a small cubbyhole, it will open up a world of possibilities for you.

At the click of the Autoscan button, you'll be able to scan in artwork, a photo or a line drawing. And easily give all your fliers, brochures, even family projects, that professionally polished look.

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*When used with the PC version and a color printer. † The IX-4015 sells for under $799, but dealer prices may vary. ©1995 Canon Computer Systems, Inc. Canon is a registered trademark of Canon

Perfect for the corner office office in the corner.

Project a worldly professional image. Or just have fun with the family.

processor, just as if you typed them yourself. (FYI, the Canon IX-4015 can double as a color copier.*)

You'll also be happy to know, the Canon IX-4015 comes with a two-year limited warranty, as well as a price tag that fits nicely in even the tightest family budget.†

For more information on the Canon IX-4015 scanner, just give us a call at 1-800-848-4123, Ext. 600. Remember, we're in your corner.

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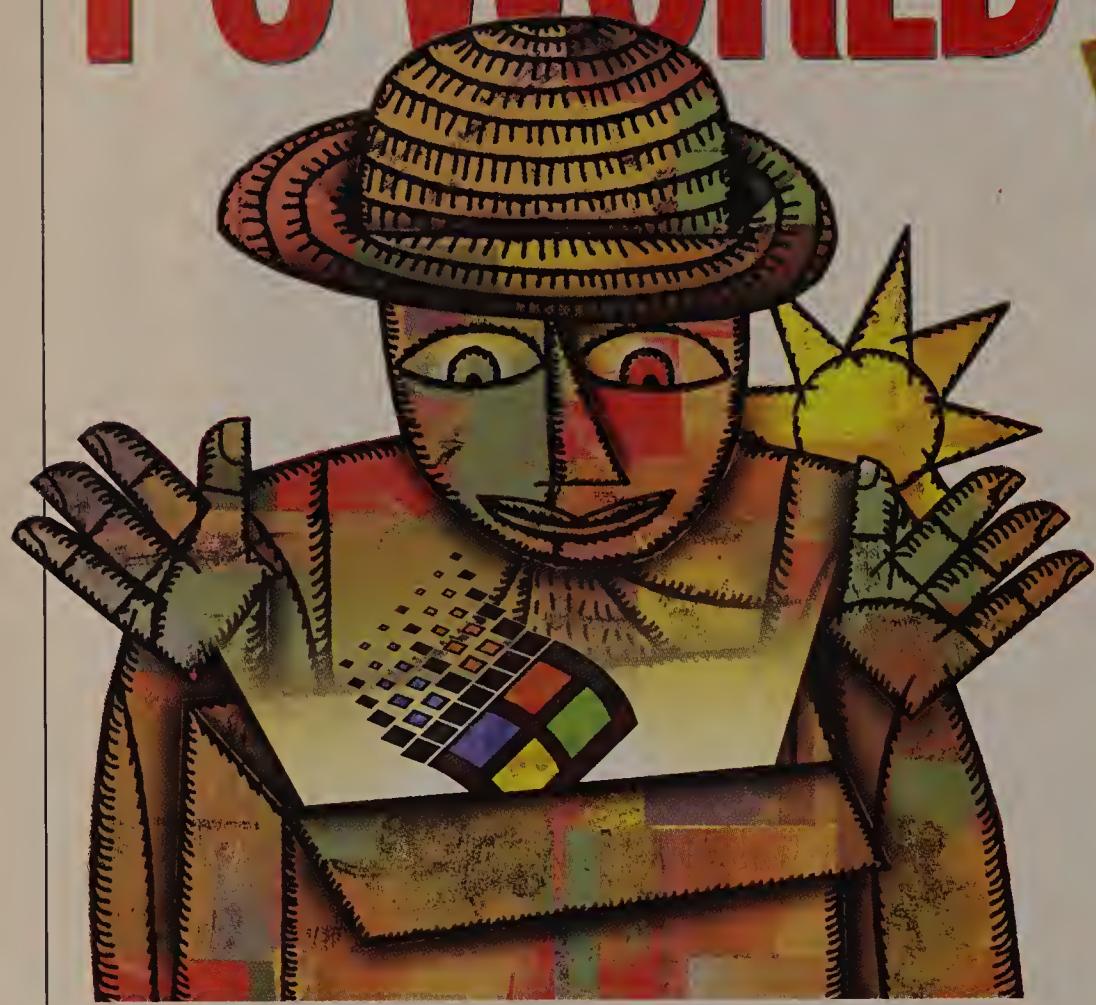

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At ZEOS, our philosophy is to make sure that you, our customer, get the best of everything. And that starts with performance. The heart of the Pantera is an award-winning ZEOS-designed motherboard. Already called "Overall performance leaders" by *PC Magazine*, the Pentium® processor-based Pantera line is now boosted even further with the addition of EDO DRAM, synchronous burst SRAM cache options and CPU choices all the way to the brand new 133MHz Pentium processor. In plain English, we've turned on the afterburners—giving you performance unlike anything you've seen before!

Beyond great performance, we also protect your investment. To ensure that your new ZEOS Pantera will serve you well for years to come, we build in more reliability, expandability and upgradability than anyone else.

For starters, all Pantera systems provide you with CPU upgradability—even Pantera Pentium processor-based systems can even be upgraded to a future OverDrive® Processor. Pentium processor-based Panteras include *six* memory sockets instead of the usual four. That means more room to grow—without having to throw away perfectly good memory when it's time to upgrade. Panteras with Pentium processors also include on-board PCI local bus SCSI and Ethernet options and the power to run all these goodies. Believe it or not, most companies are now building in small power supplies of 150 watts or less! That's great for reducing *their* costs, but it sure doesn't do much for *you*. Pantera power supplies are 200 watts *standard* and they're energy efficient—Panteras are EPA Energy Star compliant, meaning they can power down and use less energy.

The bottom line is that virtually no one else gives you any of these features to protect your investment. At ZEOS we give you them *all*!

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In addition to the latest features, you need your new system to arrive promptly and you need it to work in *your* environment when you get it. That is why ZEOS Pantera systems include your choice of Windows for Workgroups or the new Windows 95, and that is why you also get compatibility with every major operating system on the market including Win NT®, Netware®, Unix® and OS/2®. That is also why we pioneered our *Computers Now*® program—many of our most popular configurations can be shipped the *very day you order* (even custom-built systems can be shipped in about a week). You could be taking delivery of your new Pantera tomorrow!

And after your purchase, we'll be here. ZEOS was the first to provide 24 hour-per-day, 365 day-per-year toll-free technical assistance, and it's the best there is. Add to that our easy accessibility through the major on-line services and through our automated fax-back system, and you can see that we support you like no one else.

Unbeatable Value

The hottest performance for today and for tomorrow, compatibility, reliability, bundled software, the best service in the industry and incredible prices that'll leave you amazed at how much you get for so little. As *PC/Computing* said, the Pantera "...is a deal you simply can't pass up." So call your ZEOS Systems Consultant now at 800-554-5220. It's the best purchase decision you'll ever make.

PC MAGAZINE EDITORS' CHOICE — Pentium-66 April 12, 1994; DX4-100 June 28, 1994

COMPUTER SHOPPER — Pentium-60 April 1994; Pentium-90 August 1994

PC WORLD BEST BUY — 486DX2-66 January 1994, February 1994, March 1994, June 1994, December 1994, January 1995, February 1995, March 1995, April 1995; DX4-100 October 1994, November 1994, December 1994; Pentium-60 December 1994, January 1995, February 1995, April 1995; Pentium-66 June 1994, July 1994, August 1994, September 1994; Pentium-90 August 1994, September 1994, October 1994, November 1994, January 1995, February 1995

PC Best — Pentium-66 May 1994; Pentium-90 February 1995

Windows Sources Experts' Pick — Pentium-66 June 1994; Pentium-90 August 1994

Windows Magazine 1994 Recommends — Pentium-90 November 1994

WINDOWS 1995 WIN 100 — Pentium-90 May 1995

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486 & DX4 Processor-based Panteras							
486DX2-66	$1495	486DX2-66	CN! $2095	486DX2-66	CN! $2495	486DX2-66	$2995
DX4-100	$1595	DX4-100	$2195	DX4-100	$2595	DX4-100	$3095
Pentium™ Processor-based Panteras							
75MHz	$1695	75 MHz	CN! $2295	75MHz	CN! $2695	75MHz	$3195
90MHz	$1795	90 MHz	$2395	90MHz	CN! $2795	90MHz	$3295
100MHz	$1945	100 MHz	$2545	100MHz	$2945	100MHz	CN! $3445
120MHz	$2145	120 MHz	$2745	120MHz	$3145	120MHz	CN! $3645
133MHz	$2295	133 MHz	$2895	133MHz	$3295	133MHz	$3795
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➤ **528MB** local bus EIDE hard drive, 14ms		➤ **850MB** local bus EIDE hard drive, 11ms		➤ **1.2GB** local bus EIDE hard drive, 10ms		➤ **1.6GB** local bus EIDE hard drive, 10ms	
➤ 3.5" 1.44MB floppy disk drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive	
➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM	
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➤ Microsoft Mouse		➤ Microsoft Mouse		➤ Microsoft Mouse		➤ Microsoft Mouse	
➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11		➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11		➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11		➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11	
➤ **MS Works 95** or MS Works		➤ **MS Office Pro 95 & Bookshelf 95 CD,** or MS Office Pro & Bookshelf		➤ **MS Office Pro 95 & Bookshelf 95 CD,** or MS Office Pro & Bookshelf		➤ **MS Office Pro 95 & Bookshelf 95 CD,** or MS Office Pro & Bookshelf	

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- ➤ Genuine Intel® Processor. ZIF socket for easy upgrading.
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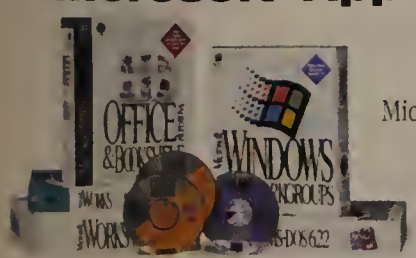

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Circle 237 on reader service card

ZEOS® Meridian™ Notebooks...

Meridian 850 Notebook

Meridian 400 Subnotebook

Meridian 800 Notebook

Meridians with unretouched photos of active matrix displays.

Go To The Head Of The Class.

ZEOS Meridian notebooks are the classiest acts in town, each the leader in its category, ready to give you the power, performance and mobility that you could only dream of until now!

While each Meridian product is distinct, they all have several intelligent features that set them apart including local bus video; an 84-key keyboard with a comfortable palm rest and integrated TruePoint™ pointing device; and the most solid construction available so that you won't be left smarting.

Meridian 400 Subnotebook

WINDOWS MAGAZINE 1995 WIN 100 May 1995

"ZEOS is out to prove that good things do come in small packages with its Meridian 400C subnotebook," reported *Windows Magazine.*

At 3.9 pounds, the Meridian 400 is molded with a special carbon-fiber material that cuts weight and improves durability. And with a DX4-100MHz processor *standard*, it may well be the highest performance subnotebook available; "faster than a speeding desktop" is how *Computer Shopper* described it.

In addition to great performance, you also get hard drives to 350MB, RAM that's user upgradable to 20MB, two Type II PCMCIA slots, an external ultra-light 3.5" 1.44MB floppy drive (included in Packages 2 and 3) and your choice of active matrix or dual scan color screens. Amazing!

Meridian 800 Notebook

WINDOWS MAGAZINE 1995 WIN 100 May 1995

"The 800C notebook offers sleek styling, solid construction and hot performance....one of the fastest notebooks we've ever tested," said *Windows Magazine.*

At 6.3 pounds, the Meridian 800 full-size notebook is light enough to travel anywhere yet, with its whopping 10.3" dual scan or 9.5" active matrix color display, is large enough to use for presentations and everyday computing.

To complete the package, you also get a DX4-100MHz CPU, up to 20MB of user-upgradable RAM, a removable hard drive to 528MB, a built-in 3.5" 1.44MB floppy drive and PCMCIA slots supporting two Type II or one Type III devices. Full desktop features that fit in your briefcase!

Meridian 850 Notebook

"On our Graphics Winmark 95 tests...ZEOS's Meridian 850C grabbed the top position. The ZEOS 850C again finished first on our Disk Winmark 95 tests," reported *PC Magazine.* Grade A+ for performance!

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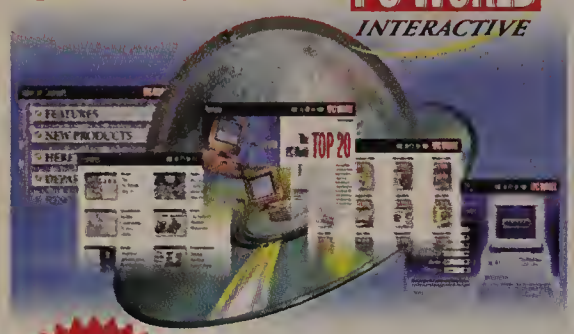

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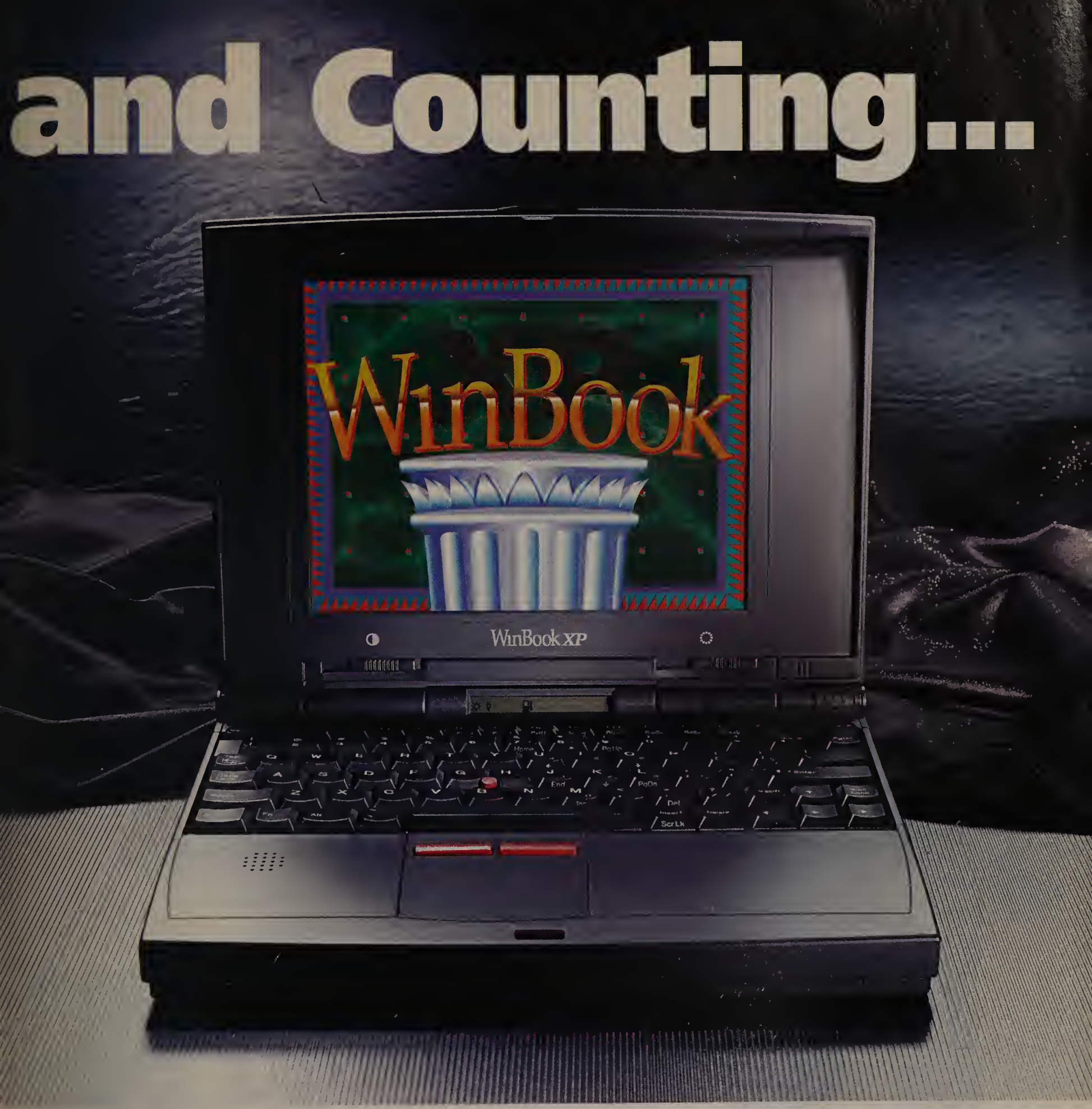

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WinBook XP DX2/50
8/255 Monochrome

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April 1995,
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Laptop Buyer's Guide
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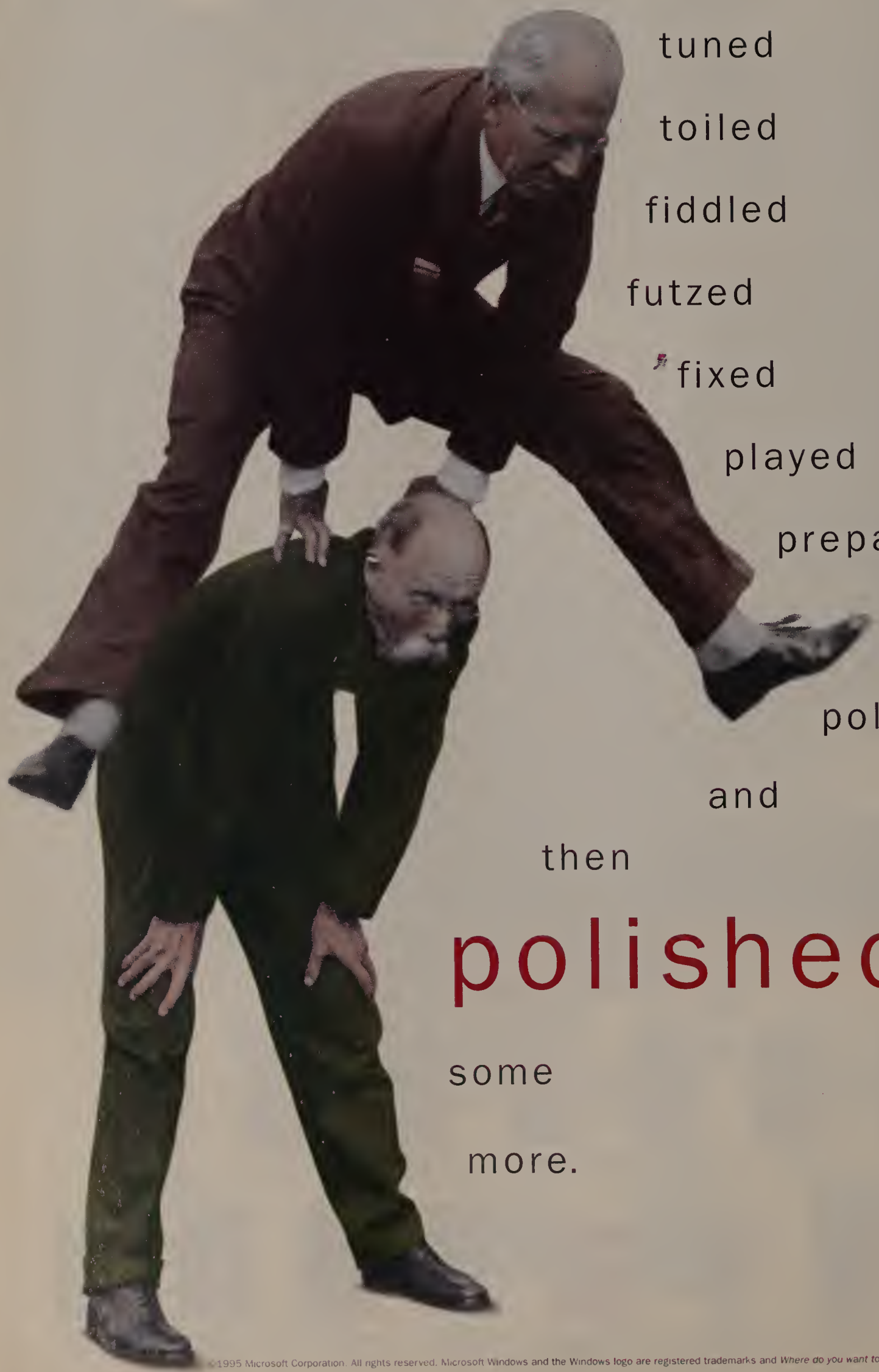

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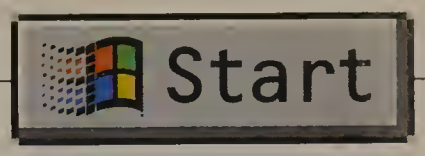

We hope you have half as much fun as we did.

Welcome

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32-bit applications

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long filenames

enhanced multimedia

integrated networking

built-in access to the Microsoft Network

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Thirty Looks at 32-Bit Windows 95 Programs

Even a major new operating system like Windows 95 is but a means to an end. Without application programs, an operating system can't perform any useful work, educate, entertain, or otherwise earn its keep. Trouble is, most new operating systems have few applications to offer in the first year after their arrival and survive only if they offer backward compatibility with old applications or have patient and well-heeled sponsors. Windows 95 has both of these advantages plus a wealth of new 32-bit applications to see it through its early trials. In "First Looks: Software for Windows 95," Senior Associate Editor Lincoln Spector has assembled hands-on commentary on no fewer than 30 new 32-bit Windows 95 applications that were already running in July and August when *PC World*'s contributors surveyed the new crop. The software survey also provides information on another 26 applications that weren't available for preview in time for this article.

But why move to new 32-bit applications when most old 16-bit Windows applications will still run? Why move to Windows 95 at all? As we've made clear in previous issues, opinion at *PC World* holds almost unanimously that Windows 95 offers huge improvements in ease of use, ease of configuration, networking, and general stability—even for 16-bit applications. But one of the compromises necessary to assure Windows 95's backward compatibility without sending its memory requirements through the roof is that all 16-bit Windows applications have to share a single memory space. That means one misbehaving old application can bring down the rest, jeopardizing all your work, just as in the old Windows. The Windows 95 architecture offers better protection for new 32-bit applications, giving each its own separate memory area. This is a strong argument for moving to 32-bit applications as soon as you can. If your work involves lots of graphics, don't hesitate—go straight to Windows 95 as soon as the applications you need are available. Graphics specialist Deke McClelland explains why in "Great-Looking Threads."

A Bill of Rights, and More

PC World's commitment to the consumer side of computing—for both home and business users—is unmatched, as several articles in this issue show.

In *PC World @Home*, Senior Writer Roberta Furger lays out the Home PC Buyer's Bill of Rights. While these rights haven't been ratified by a constitutional convention, you'll no doubt wish you could count on all of them when you buy your next home PC. You'll definitely want to check out how many of these rights the companies on your short list support.

Theresa Carey's "Cheap PCs: Brand Name vs. Brand X" assays the value of locally assembled PCs. In a report based on real shopping and extensive testing, Carey compares inexpensive off-brand PCs with widely available names. Associate Editor Harry McCracken reveals the best and worst ways to cut PC costs. Their findings should improve your approach and your results in buying your next PC.

And Executive Editor Steve Fox has rounded up a special report on electronic commerce that takes a look at what this emerging field will mean for you and your business, today and in the future. Roberta Furger reports on the gold rush under way on the electronic frontier, examining both the ways people are launching online businesses and the various proposals for implementing electronic payments that are routine and secure. Rod Kuckro explains that the real action in electronic commerce is taking place in the big three commercial online services, not the vaunted Internet, though this situation may be changing: Vince Emery explores the fast-developing world of the Internet in "Top Web Sites for Online Business."

This issue also introduces the *PC World* Top 10 Monitors. Like our other continuous Top 10 and Top 20 product ratings, the Top 10 Monitors will provide an up-to-date recommendation whenever you need it rather than in a single month of the year. The inaugural Top 10 Monitors looks at the 15-inch variety. In a battle of scan rates, dot pitches, and image quality, Princeton Graphic Systems' Ultra 15 and NEC's MultiSync XV15 walked away with the Best Buys.

In our other Top 10s this month, the Diamond Stealth64 Video and STB Velocity 64V are the Best Buy graphics accelerators; among personal printers, the NEC SuperScript 610plus (black-and-white) and the Canon BJC-600e (color) take the honors.

In Windows 95, one misbehaving 16-bit app can bring down the rest, jeopardizing all your work, just as in the old Windows.

Phil Lemmons

Phil Lemmons, Editor in Chief

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Loving and Hating Bill's Latest, Fleeting Free Support

Real-World Feedback

I have just received my August *PC World* and must commend you on one of the most objective reviews of Windows 95 I've seen. I particularly enjoyed "Notes From the Usability Lab." It's about time we got some feedback from average computer users. Keep up the good work.
Jeff Bilen,
Wallenstein, Ontario, Canada

Cover Story Coup

Thank you for a job well done on your August issue. I hope future articles on Windows 95 are as informative. Of course, a good number of OS/2 users will complain about your "biased" reporting in the comparison test, but who cares? You let them voice their views in "Report From an OS/2 Devotee."

I really enjoy the way that *PC World* backs up its editorial content with product testing, and I appreciate your willingness to say where the bugs are, in print. Many computer consumers are indebted to you.
Kevin Reed, CompuServe

Why Run an Unbalanced Test?

I just picked up your magazine for the first time and was delighted to see your comparison of OS/2 Warp and Windows 95 in "Notes From the Usability Lab." I expect to buy a computer in the next few months and have been debating operating systems.

I was therefore disappointed to discover that your article was so biased as to be useless: your testers all had previous Windows experience, while those with OS/2 experience were disqualified from consideration. It seems clear to me that your testers would naturally be more comfortable with the system to which they were already accustomed—even allowing for the changes that came with the new version—than with a totally new environment. If you were going to predetermine the results, why run the test at all?
Emily Van Ark,
Bloomfield Hills, Michigan

Editor's response: The Windows 95 user interface is a complete reworking of what came before. The Warp interface, on the other hand, is only a slight enhancement on that of OS/2 2.*x*. There would have been nothing for an OS/2 user to learn.

Furthermore, the overwhelming majority of *PC World* readers—and indeed, of the U.S. business world at large—uses Windows 3.*x* today. In our August coverage of Windows 95, we readily conceded that OS/2 Warp users would be "unswayed by Windows 95's charms." But, as we stated in "Notes from the Usability Lab," if OS/2 Warp (or Windows 95, for that matter) is to gain wide acceptance, it will have to win over the enormous installed base of Windows users. The only way to determine either operating system's ability to do just that was to use Windows 3.1 users as subjects. —*Lincoln Spector*

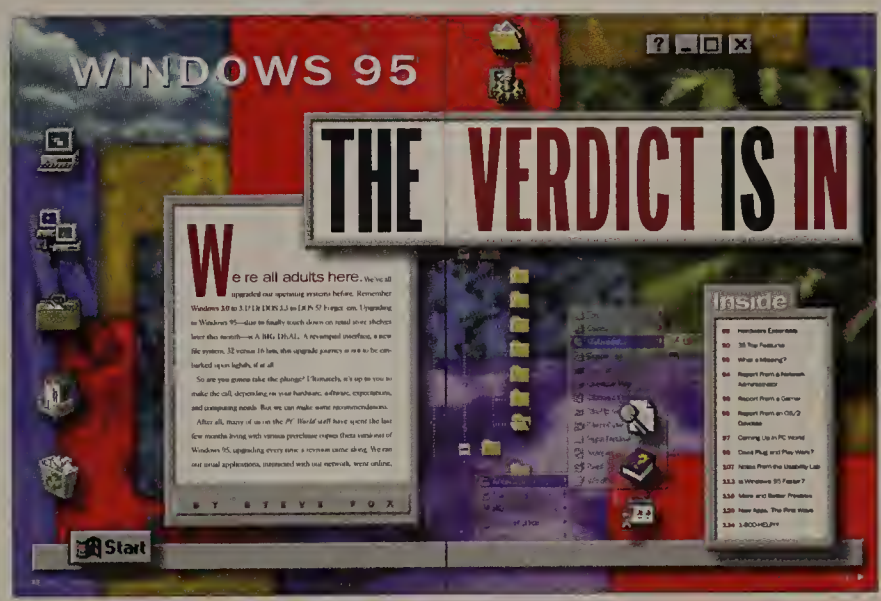
Good Old Usable Bob

I suspect that some of your "usability" testers would be better off with Microsoft Bob.
Michael Patrick, Houston, Texas

Mac Pacesetter

Four of the five "guinea pigs" in "Notes From the Usability Lab" had extensive Macintosh experience, but you included no comments from them comparing Windows 95 or Warp to the Mac OS. If they'd had the opportunity, I'm sure those users would have made some choice observations.

No doubt Bill Gates will make another billion from his latest effort to catch up, but what a mess to foist on the unsuspecting public! I will now hug my Mac in gratitude for giving young Bill something to shoot for.
David A. Fann, Internet



JEFF BERLIN

Underwhelmed by Bill's Latest

Having made numerous contributions to the Bill Gates Benevolent Fund over the years, I've generally been satisfied with my investments—especially considering the lack of alternatives. I've also been pleased with the advice and information provided by *PC World*'s editorial staff. But your coverage of the multimedia spectacle called Windows 95 finds me questioning my loyalties.

This Windows 95 thing puts me in a bit of a pickle. First, I find that I must throw away my poor little AST SX33 with its pathetic 4MB of RAM, because it's not a real computer. What a shame—it's the most reliable hardware I've used in 20 years of computing. No matter; I'm told I need Windows 95 *now*. And if my old apps don't run under it, I can a) keep Windows 3.1 around; b) pay for upgrades; or c) hang around and wait for new versions of

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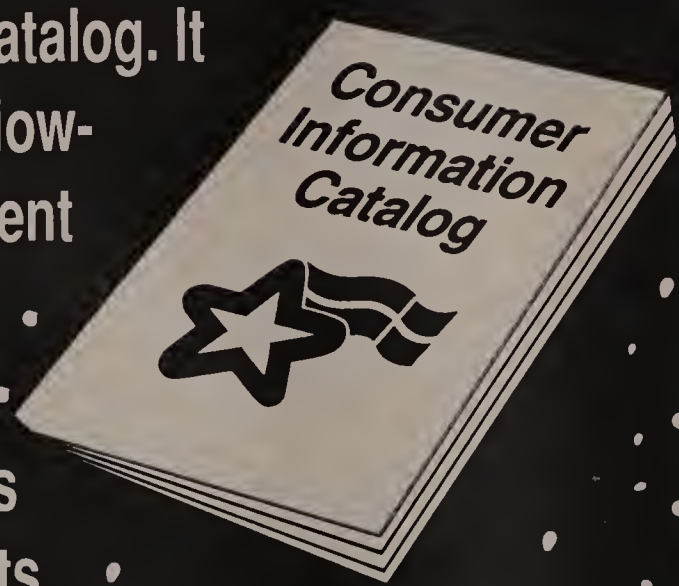

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Suspended Support

I found several articles in the August issue to be of great interest, particularly "1-800-HELP!!!" If a program is created properly and its manual is well written, users shouldn't have to make a lot of calls.

But when there's a way to make a buck, companies like Microsoft find yet another way to drain us. Free support for only the first 90 days is a weak policy. As a computer-literate user, I need support only in extreme situations, which sometimes crop up months after purchase.

Jon L. Miller, America Online

Skipping a Dialog Box

As part of my routine, I create and edit dozens of spreadsheets on a large network. To keep track of where these files are, I must show the path and file name on all of my reports. Using the Header/Footer dialog box in Excel gets tedious, though. In the July *Spreadsheets* section, this problem was solved with a simple macro. And it works great! Thanks for the help.

Dennis A. Anderson, Temecula, California

32-Bit Shortcut

Thanks for the July *Hardware Q&A* item about 32-bit file and disk access. After upgrading my hard drive and going through the learning curve of logical block addressing, I just couldn't get 32-bit access to work. Your article saved me lots of time and frustration. Keep up the good work.

John Spracklin, Wilmington, Massachusetts

Corrections and Clarifications

In August's "New Apps: The First Wave," the chart said the Windows 95 version of Meca Software's Managing Your Money was expected to ship by 1966. Make that 1996.

On page 198 of the August issue we printed incorrect telephone numbers for MIS Computer. The correct numbers are 800/733-9188 and 510/226-9188.

To obtain the Free Agent program discussed in August *Help Line*, use FTP to **ftp.forteinc.com** in the **/pub/forte/free_agent** directory. The file name is **fagent10.zip**.

PC World regrets the errors.

Letters *welcomes your responses and ideas.* *See page 12 for contact information.*

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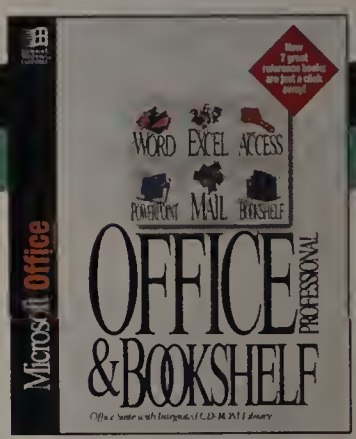

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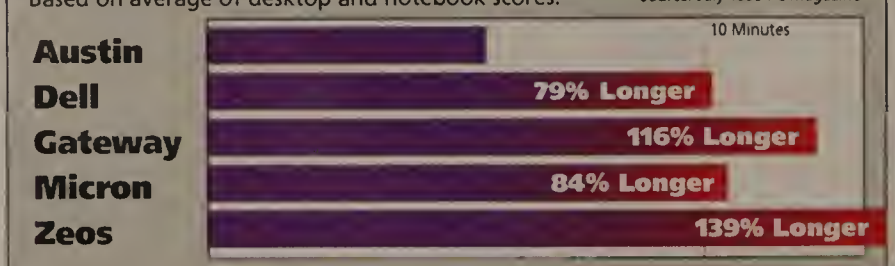
Tech Support Average Response Time

Based on average of desktop and notebook scores. Source: July 1995 *PC Magazine*



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• Windows 95 Pre-Installed • 2 Type II or 1 Type III PCMCIA Slots • Integrated Pointing Device • EPP/ECP Parallel, 16550 High Speed Serial, Keyboard, SVGA Ports • 16-Bit Business Audio Features: Built-in Microphone and Speaker, External Jacks for Line-In/Line-Out • True Speech Recognition: Windows Sound System, Cylogic Voice User and External Mic • One-Year Parts & Labor Warranty	**Business Audio P5-75** $3,341 • 75MHz Intel Pentium Processor • 256KB 64-Bit L2 Cache • 10.2" TFT Color Display • 8MB 64-Bit RAM (exp. to 40MB) • 543MB Hard Drive • 16-Bit Business Audio • True Speech Recognition • Weight with Battery: 6.8 lbs. • Business Lease: $122/month	**Austin Vista 486DX4-100** $2,247 • 100MHz Intel 486DX4 Processor • 11.3" DSTN Display • Local Bus Video • 8MB RAM (expandable to 28MB) • 262MB Hard Drive • Local Bus IDE • 16-Bit Business Audio • True Speech Recognition • Weight with Battery: 6.5 lbs. • Business Lease: $87/month BYTE Finalist	**Austin *Edge* 486DX2-50** $1,854 • 50MHz Intel 486DX2 Processor • 9.5" STN Display • 8MB RAM (expandable to 20MB) • 262MB Hard Drive • Local Bus IDE • External 3.5" 1.44MB FDD • Advanced Power Management Compliant • Weight with Battery: 4.8 lbs. • Business Lease: $72/month

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Two 5-watt-per-channel amplified MiniTower speakers
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Designed for Microsoft Windows 95

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Key #37723.

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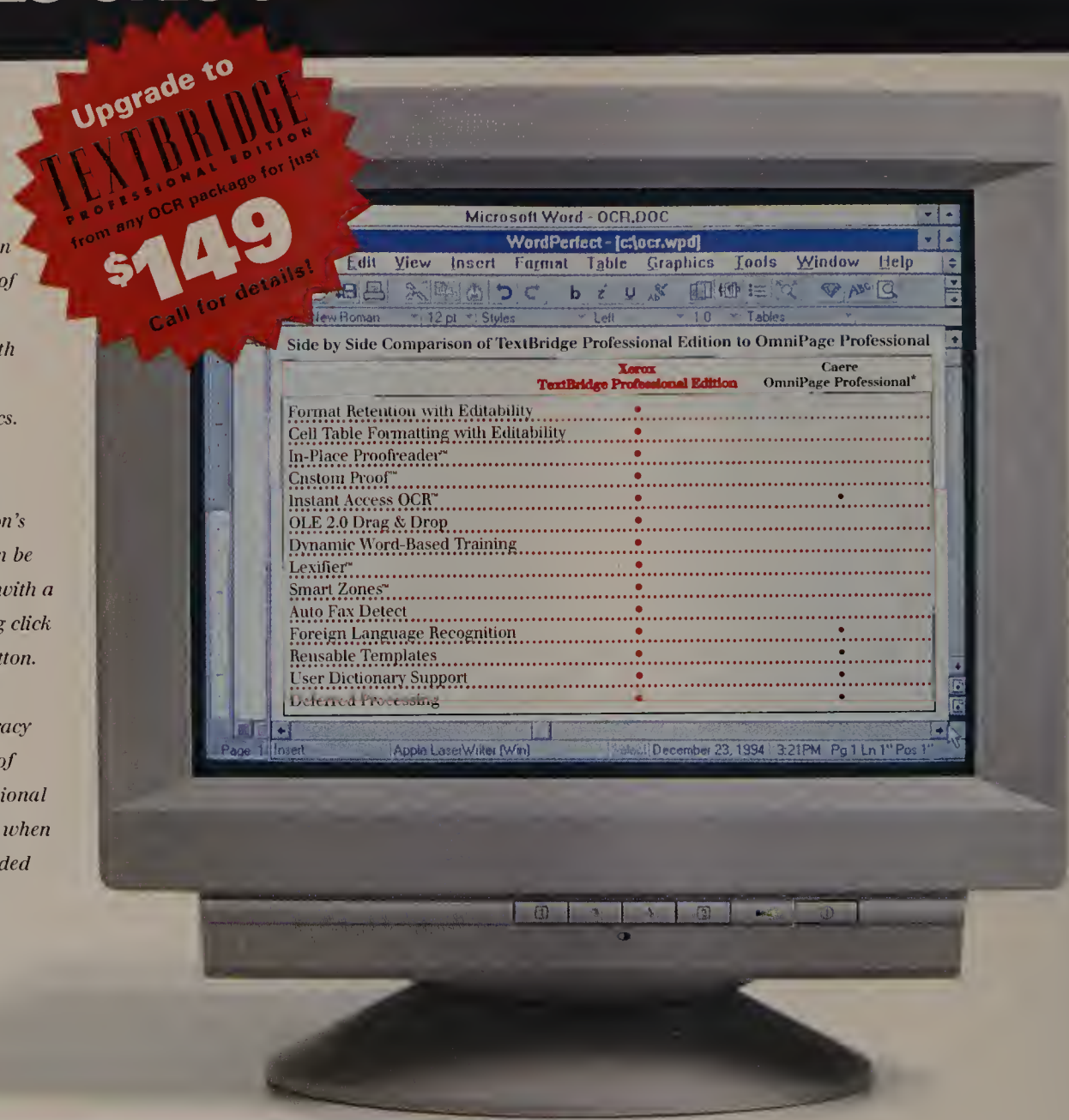
Xerox just rewrote the book on OCR. Take a look at the table of contents.



TextBridge® Professional Edition retains the format of the documents you scan—complete with fully editable text, tables, and graphics.

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* Based upon Caere product literature.

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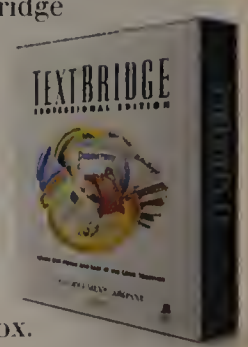

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Think You're Virus-Proof? Think Again

Just because your company's computers run antivirus software doesn't mean you're safe. In fact, most computer users mistakenly believe that an occasional virus scan secures their systems from invaders. But not all antivirus programs do the job effectively. Worse, a program can be as good as worthless if it isn't updated regularly to catch the latest strains. This month Bob Holmes, a service technician with Western Telematic of Irvine, California, explains how his firm learned the hard way that not all virus-protection software is created equal. —*Ed.*

A Not-So-Funny Bug

When you run a well-known company with thousands of customers, you can't afford to lose data to an invading computer virus. Viruses can range from the merely irritating to the downright devastating—and finding and eradicating either kind can take hours of effort. And if a virus messes up a file containing key product information, your customers and reputation could suffer, too.

The 50-employee company I work for—which makes PBX recorders, data communications products, and printer-sharing devices—found out about the need for virus protection the hard way. We run 30 PCs, 12 of which are connected via two local area networks. Our sales staff also relies on notebook computers, and many of us regularly share floppies and download files from bulletin boards and online services—all potential ports of entry for viruses.

Here's what happened: Until a few months ago, we trusted whatever virus protection software came preloaded with our systems. Occasionally someone would scan a hard disk to search for viruses, but for the most part, no one even gave them a thought. In fact, we had no corporate protection policy in place, and we never bothered to update our antivirus software.

One day, a product manager happened to scan his hard disk and discovered a virus called 'Form' in his computer's boot sector. Even after he told his antivirus software to clean it up, the problem persisted. Soon thereafter, we noticed that we could not boot three of our desktop computers. Then I found I couldn't start up my PC, even when I tried doing it from another boot disk. Nothing worked, so I had to boot from a floppy, type the dreaded FORMAT at the C> prompt, and reinstall all my software.

Bob Holmes, service technician for Western Telematic in Irvine, California.

That's when I started doing some research. As it turns out, the Form virus is highly infectious. Besides freezing up the computer at boot time, it can play tricks with the keyboard—for example, sounding a beep with each keystroke on the 18th of the month or displaying an obscene message about someone named Corinne.

I began scrambling for a fix to our crisis. Recalling a shareware program I'd seen on a bulletin board, I downloaded it and tried to use it to clear up the Form virus. Though the new software, like the older program, successfully identified the virus, it wasn't able to eradicate it; when I called the manufacturer's tech support number, the person I talked to acknowledged that the product couldn't clean up Form.

There we were, back at square one. After surfing the Net in an effort to raise names of other antivirus manufacturers, I eventually found S&S Software, a company that happened to be just down the street from our office. The staff assured me they could get rid of Form. What's more, they offered a full money-back guarantee if the program, Dr. Solomon's Anti-Virus Toolkit, wasn't successful.

I was sold. We purchased the software, and it worked. After spending long hours checking all the computers and software in the building for other signs of the sneaky virus, we were satisfied that the insidious Form had finally been banished.

Words of Wisdom

What did we learn from our brush with viral catastrophe? First of all, we now understand the importance of shopping around for a comprehensive program. Though every antivirus program claims to locate all 6000-plus known viruses, some get rid of a virus while others merely alert you. So it's important to do your research: Will the program you're considering get rid of

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viruses as well as alert you? What viruses *can't* it fix? How does it deal with "stealth" viruses that mutate from infection to infection (so-called polymorphic viruses)? Can it check compressed files? What kind of update service and support does the company provide? Can you get your money back if the software can't fix a problem?

Second, we learned the importance of making virus hunting a regular and automatic part of our daily routine. Now when employees turn on their PCs in the morning, the software—in the Windows Startup group—automatically scans all their files.

We also learned that regular updates are essential. Given that some 200 to 300 new viruses are discovered monthly, we make sure that every three months, when the manufacturer distributes updated software, we download the new version from the company's bulletin board.

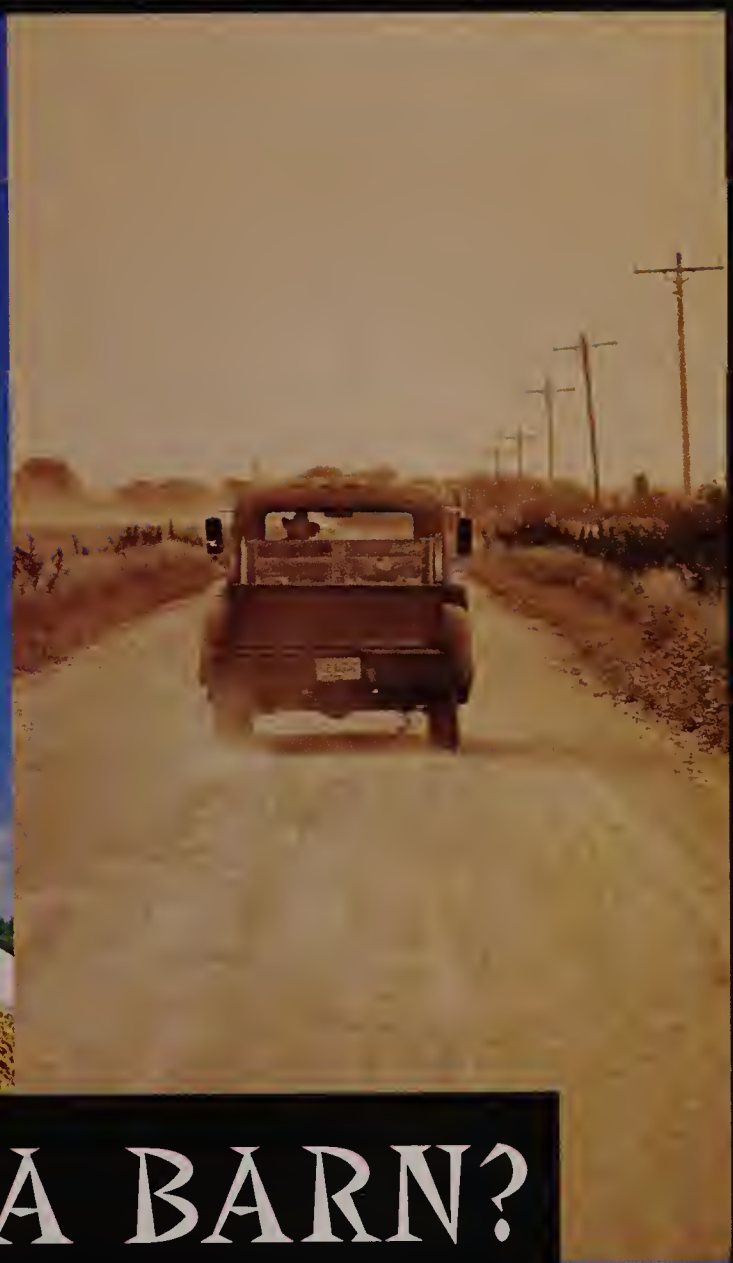
Finally, we learned how lucky we had been. The virus hadn't spread beyond a few computers, and it hadn't affected our production process. But had it been a more virulent invader or one that damaged critical files such as our customer database or production specifications, we might have been in real trouble. We now estimate that a nasty infection might easily have cost us 500 hours in downtime and $15,000 in labor to reinstate our systems. And the possibility of losing customer data to a virus, risking a higher failure rate on our scrupulously tested products, or infecting our customers' machines is simply unthinkable.

While no permanent damage was done during our virus misadventure, we found out that sitting back and thinking we were secure was just plain dumb. So heed our words to the wise: The price you pay for good, regularly updated antivirus software is money well spent.

- **Dr. Solomon's Anti-Virus Toolkit, version 7.12** $125; S&S Software; 617/273-7400
  Reader service no. 608

Edited by Bronwyn Fryer

Bronwyn Fryer is a contributing editor for PC World. *If you use PCs to manage people and other resources in a business environment, we want to hear from you—we pay $300 for published columns. See page 12 for contact information.*



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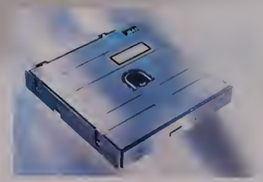
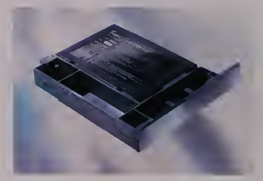
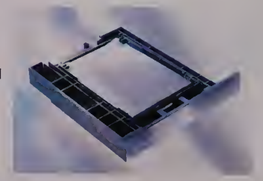


Want enough power to work through a coast-to-coast flight? Just slip in a second state-of-the-art lithium-ion battery.



Need additional storage? You're in luck. The VersaBay II lets you easily snap in a second hard drive.



And, thanks to the VersaBay II, all you have to do is insert the 1.44MB floppy disk drive for software and document installation.

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In an industry where change is the only constant, Gateway 2000 is proud of our loyal customers. How are we thanking them for 10 years of success? We asked our neighborhood Hallmark store, and they said, "10th anniversary gift? Why, traditionally that's tin!" So, we threw that around for awhile, then worked with our suppliers to bring you an incredible price on an extra-special, limited quantity computer: the system of systems, the grandaddy of them all ...

The 10th Anniversary System

Gateway's 10th Anniversary System

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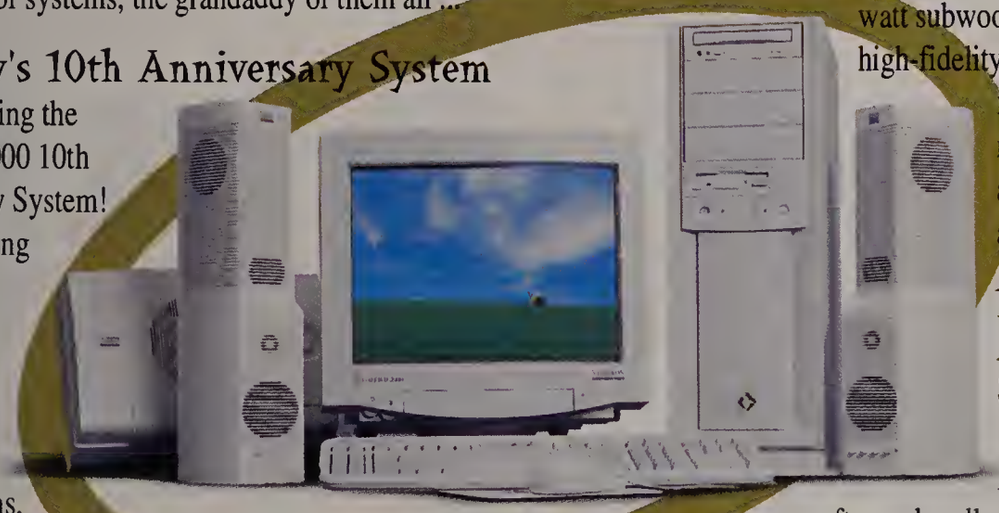

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- 3.5" Diskette Drive
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- **New 104+ Keyboard**
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- MS Works 95
- **Gateway Gold Service & Support**

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- PCI Enhanced IDE Interface
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- 4X CD-ROM Drive
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- 15" .28dp CrystalScan Color Monitor
- 7-Bay Desktop Case
- **New 104+ Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
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P5-120

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- 256K Pipelined Burst Cache
- **1GB 9ms Mode 4 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM Drive
- 3.5" Diskette Drive
- 15" .28dp CrystalScan Color Monitor
- 7-Bay Desktop Case
- **New 104+ Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- **MS Office 95, Professional Edition* with Bookshelf '95**
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P5-133

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- 16MB EDO Performance-Enhanced Memory
- 256K Pipelined Burst Cache
- **1GB 9ms Mode 4 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM Drive
- 3.5" Diskette Drive
- **15" .26dp Vivitron Color Monitor**
- 9-Bay Tower Case
- **New 104+ Keyboard**
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10th ANNIVERSARY SYSTEM

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- 16MB EDO Performance-Enhanced Memory
- 256K Pipelined Burst Cache
- **1.62GB 9ms EIDE Mode 4 Hard Drive**
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- 16-Bit Ensoniq® Wavetable Sound Card & Altec™ **Lansing Surround Sound Speakers w/ Subwoofer**
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- 3.5" Diskette Drive
- **17" .26dp Vivitron Color Monitor**
- 9-Bay Tower Case
- **New AnyKey+ Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
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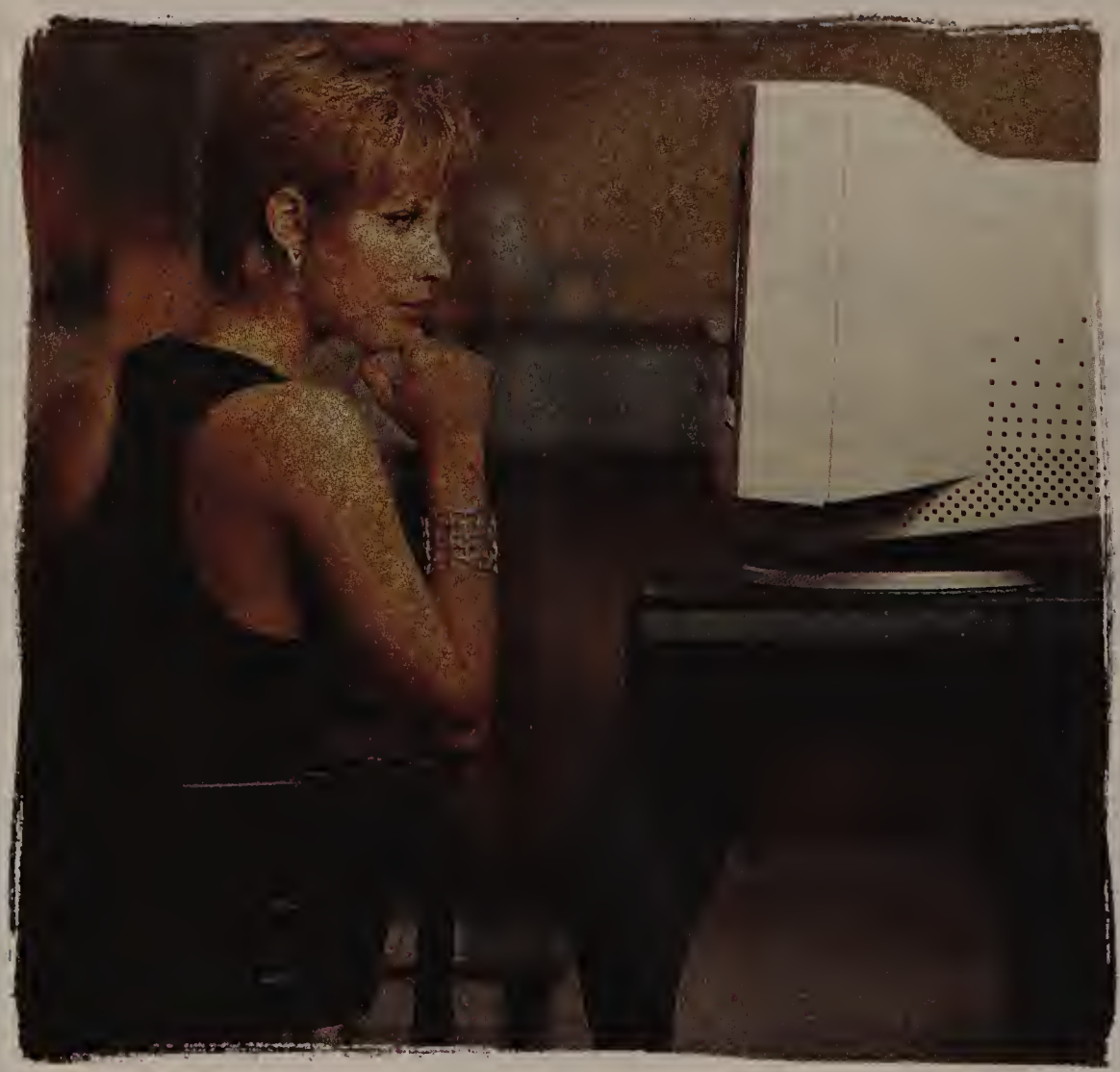

From the continent that gave us museums and luxury automobiles come their combined spiritual equivalent: Nokia monitors. Nokia is already a household name (and cafe and office name too) throughout Europe. And now Nokia monitors are quickly winning the hearts and eyes of Americans too.

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How Do You Spell Windows 95? K-l-u...

Can you spell the word pronounced "kloodge"—the one used in the computer industry to describe jury-rigged hardware or software? Word for Windows' spelling checker accepts *kludge*. I prefer to spell it *Windows 95*.

Look at the ancient DOS file system—if you have a strong stomach. Windows 95 does give us long file names, but they're basically aliases for the "real" eight-dot-three names hidden underneath. While the new Windows can run old programs, those programs don't understand the longer file names. And remember that silly old DOS rule about not putting more than 512 entries in your root directory because there isn't room for them? Henceforth make it 256, because every long file name under Windows 95 just happens to take up two directory slots.

True, Win 95 can run almost any DOS program one way or the other. One way—the good way—is to do it in a window. Another is to perform a feat of sheer chutzpah. Launch your DOS program, and Windows 95 reboots the system and runs DOS with temporary config.sys and autoexec.bat files. When you exit, the system renames the temporary files, brings back the originals, and restarts Windows 95 again.

Don't believe me? Right-click an .exe file icon and select *Properties*, then *Program* and *Advanced*. Click the *MS-DOS Mode* check box, then the *Specify a New MS-DOS Configuration* radio button. You'll see the areas into which you can type commands for the special config.sys and autoexec.bat files that get executed only when this particular DOS program is invoked. I mentioned that this was a kludge, did I not?

Try making a shortcut to a file. (*Shortcuts* are another touted Win 95 ease-of-use feature.) Now rename or move the file, and the link between it and the shortcut instantly breaks. Windows 95 tries to find the file (via similarities in date and size), but it often fails. Delete a file and invoke its shortcut, and poor Windows 95 scans your hard drive like a spurned lover searching haplessly for a vanished mate. OS/2 and the Mac Operating System are a whole lot smarter about things like this.

But, hey, Windows 95 is pretty darned compatible! That was what you and I—the computing public—asked for; Microsoft is nothing if not responsive. File names aside, Win 95 can run even ancient DOS programs like the version of PC-File I bought back in 1984. Come to think of it, Windows 95 would be truly amazing if it weren't a kludge.

Delete a file and invoke its shortcut, and poor Windows 95 scans your hard disk like a spurned lover searching haplessly for a vanished mate.

Starting From Scratch

We haven't even mentioned hardware. Win 95 does a pretty fair job of managing the box, but there are plenty of goofy devices (especially old ones) that can throw it for a loop. But a truly integrated, nonkludgy operating system would reject backward compatibility and insist that people use software and hardware designed specifically for it.

Guess what? That was Steve Jobs's all-or-nothing policy for the Macintosh back in 1984. If you owned some other machine (including an Apple II), you were out of luck at the compatibility ball: You had to start from scratch. Apple's tight control over both hardware and software gave the Macintosh a high degree of integration—along with inflexibility, restricted choice, and a high price. Many people eagerly paid the premium for such a truly integrated system. But the vast majority of users preferred the cheaper, freer, anything-goes bazaar of the DOS world.

For Jobs's NeXT machine, introduced in 1988, the pitch was the same: Dump your old hardware and software! A better way is here! But by then it was already too late.

Back when Windows 3.0 was introduced, it trounced OS/2—partly because it could run multiple DOS programs and OS/2 couldn't, partly because it ran on machines with less memory, and eventually because it could run Windows software. What we really want, it seems, is to be able to use all our old programs, have access to sexy new ones, and keep our old hardware a little while longer. That's what we voted for with our dollars, and that's pretty much what Windows 95 delivers. So maybe software purists, me included, should stop whining about kludgy operating systems.

But bless us, we won't. Will that forthcoming version of Windows NT with the Windows 95 interface, I keep wondering, solve my multitasking gripes? How much more memory will it really need? And oh, yes: Will it work with PC-File?

PC World *contributing editor Stephen Manes is a columnist for the* New York Times *and coauthor of* Gates: How Microsoft's Mogul Reinvented an Industry *(Touchstone/Simon & Schuster; 1994, 800/223-2348).*

By Stephen Manes

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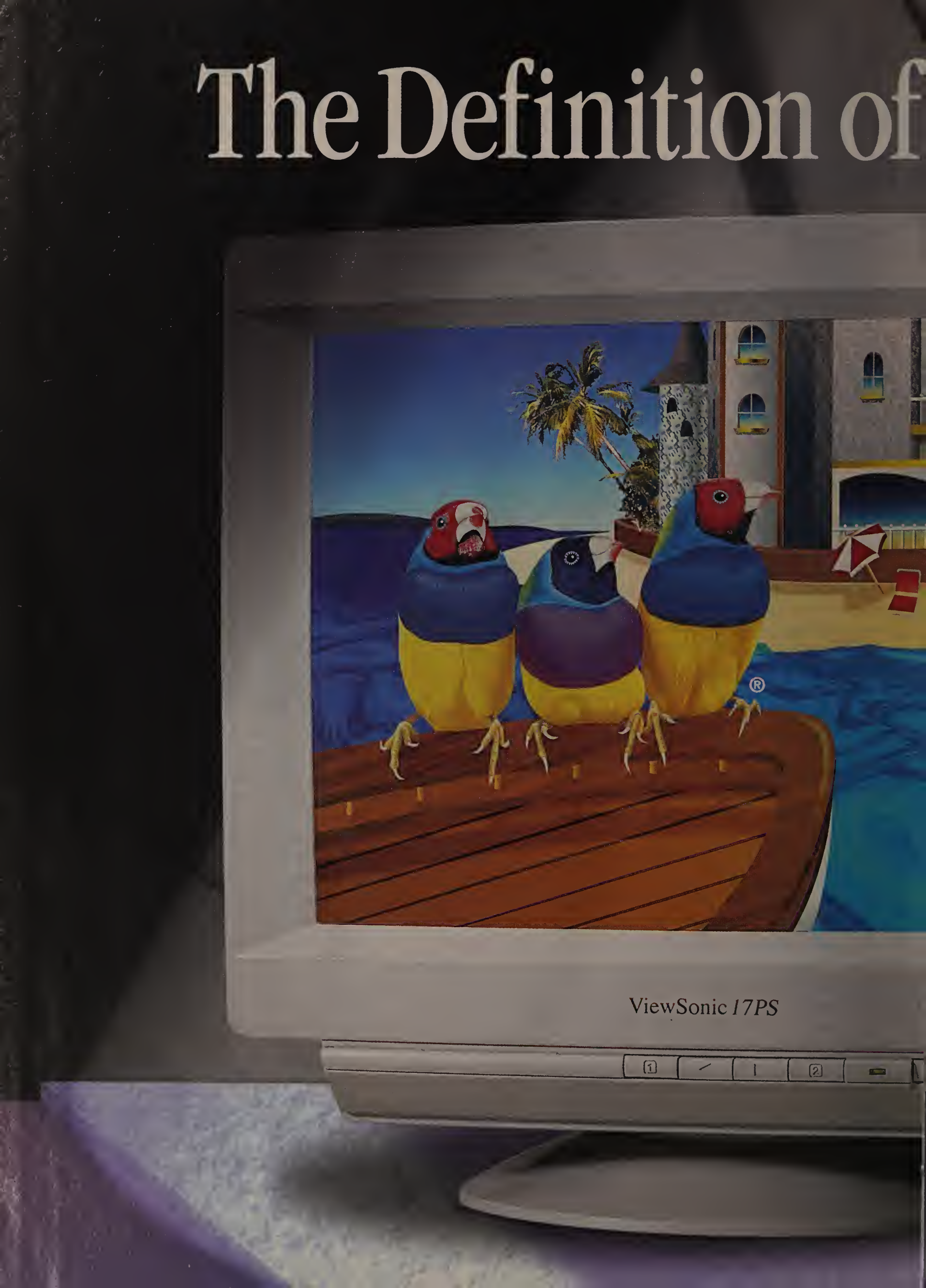

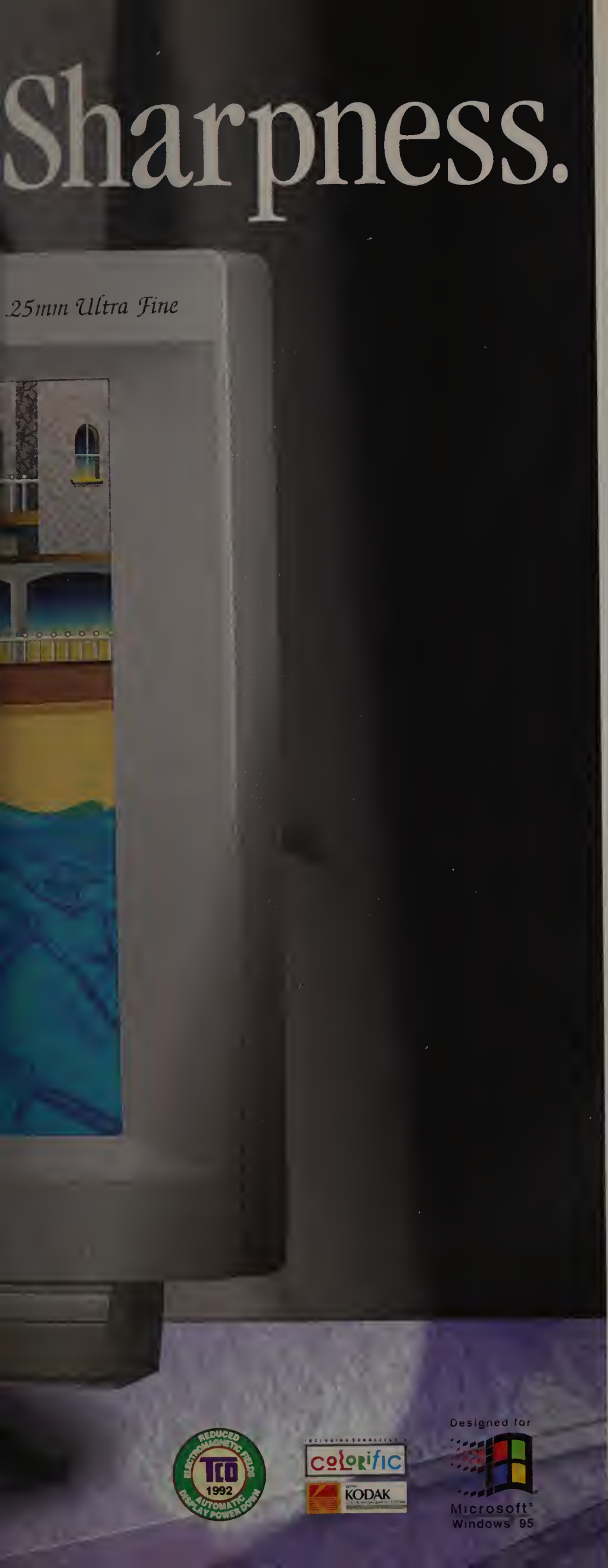

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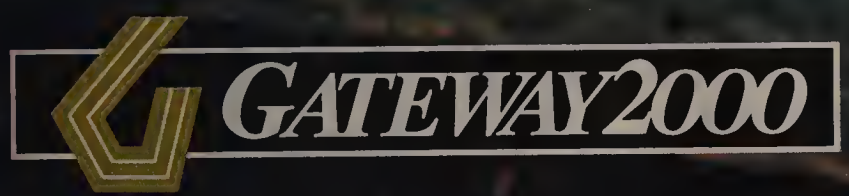

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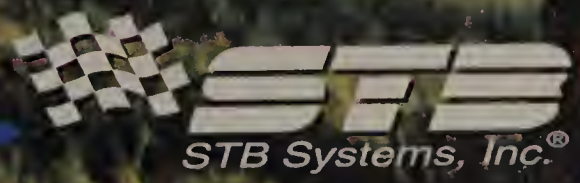


Mighty Morphin' PowerPCs

They zoom on math and graphics programs, rendering and morphing like champs. But don't look to PowerPCs to speed up your business apps. At least, not yet.

IBM'S POWER SERIES 850, based on a 133-MHz PowerPC 604 processor (top); Motorola's PowerStack Model E604 100P (middle); and IPC's Austin PowerPlay-604/100 (bottom).

Edited by Andy Reinhardt

After years of anticipation, systems based on the PowerPC processor can finally run Windows NT. Until now, the highly touted chip developed by Apple, IBM, and Motorola has run only UNIX and the Macintosh operating system. But early *PC World* test results aren't encouraging for mainstream DOS and Windows users seeking more computing power for less money: Though the first PowerPC systems are great at complex math, they're outperformed by comparable Pentium machines on conventional office applications. For most PC users, Pentium systems remain the best, most cost-effective choice.

What holds back the PowerPC chip today (outside the Apple world, where it drives the fast-selling Power Macs) is a lack of good software. DOS, Windows 3.*x*, and Windows 95 programs don't run well on the PowerPC, and only a few business productivity applications are available for the PowerPC version of Windows NT. Most of those that are don't take full advantage of the chip's power because they haven't been *optimized*, or specifically tuned, for either Windows NT or the PowerPC.

However, excellent floating-point math performance could make PowerPC systems popular for publishing, high-end graphics, and power-hungry multimedia applications. And when more and better Windows NT programs eventually become available, competition between the PowerPC and Intel's processors could result in great deals for consumers.

Head-to-Head Test

We pitted three PowerPC-based computers—IBM's Power Series 850, Motorola's PowerStack Model E604 100P, and IPC's Austin PowerPlay-604/100—against two Pentium-based counterparts. The IBM system, costing $7083 as tested, uses a 133-MHz PowerPC 604 chip, while the $7794 Motorola and $4749 IPC units use 100-MHz 604s. The two Pentium PCs—both from Dell—use 133-MHz and 100-MHz processors and sell for $4145 and $3494, respectively. All systems were equipped with 32MB of RAM, a PCI bus, a 1GB hard drive, built-in graphics acceleration, and multimedia capabilities.

The operating system was Windows NT 3.51, the first version of Microsoft's 32-bit workstation and server environment to run on both the Pentium and PowerPC processors (as well as Alpha and Mips chips). We ran a variety of software: DOS and Windows 3.1 programs, new 32-bit NT office packages, and graphics-intensive applications likely to stress floating-point math performance. All but two of the programs were shipping at the time of our tests, and the others were final beta versions.

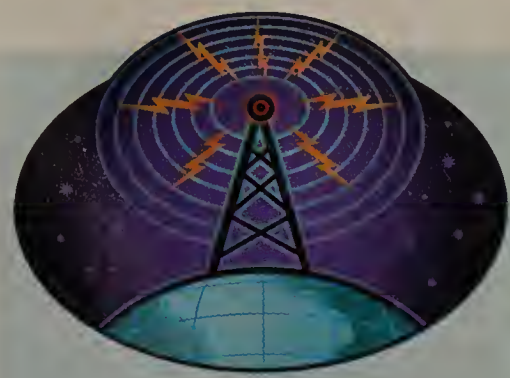
Ankle Weights

Running DOS and Windows 3.1 programs—by far the most common types of PC applications—both of the Pentium systems thrashed all three PowerPCs. No surprise here: The PowerPC chip uses different internal instructions from those of Intel's *x*86 family, and thus can't run programs written for an *x*86 processor. Instead, these programs are routed through an *emulator*, a layer of software bureaucracy that translates between the languages of the *x*86 and PowerPC. The effect on performance? Imagine Carl Lewis running a quarter-mile wearing ankle weights.

That the PowerPC systems ran DOS and Windows 3.1 programs as well as they did attests to the strength of the chip. Our results for Word 6.0a and Excel 5.0a for Windows and Paradox 3.5 for DOS are comparable to what you would get running them on a high-end 386 or low-end 486 machine. But the bottom line is that PowerPCs won't deliver an acceptable value if you're running only older *x*86 programs.

New-Generation Software

The arrival of Windows 95 could be good news for the PowerPC, because most commercial applications are being rewritten to support the new operating system's 32-bit design. All Microsoft-certified Windows 95–compatible applications will also run on



Breaking News

MSN LAUNCHES WITH A TWIST: The Microsoft Network (MSN) online service, accessible from an icon on the Windows 95 desktop, is a go. The U.S. Department of Justice decided not to take action to block the launch of MSN before Windows 95's scheduled August 24 release, but the department does say its antitrust investigation of Microsoft is continuing.

Microsoft says MSN will cost $4.95 per month for 3 hours of use, plus $2.50 per additional hour. By comparison, CompuServe, America Online, and Prodigy cost $9.95 per month for 5 hours, plus $2.95 per additional hour. This means you'll pay the same amount for 5 hours on any of the services. Microsoft will also offer a frequent-user plan ($19.95 per month for 20 hours and $2 per extra hour). Prodigy has a similar volume plan, and CompuServe is likely to follow.

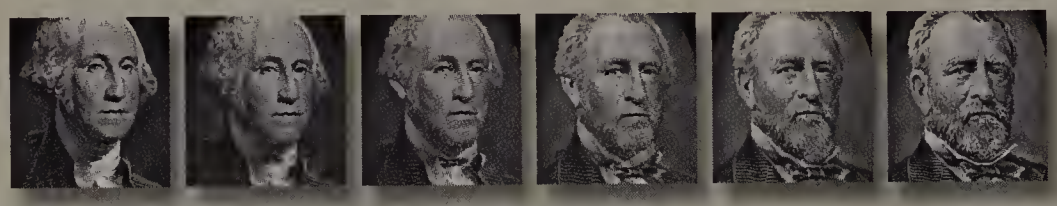
One surprise: Microsoft says it will temporarily cap subscriptions to MSN after the first 500,000 people sign up. These charter members will qualify for a special annual rate of $39.95, or about $3.33 per month. The company says limiting subscribers will allow it to ensure network quality and customer satisfaction. (Some beta testers complained of slow performance, so Microsoft may still be working out technical kinks.) A Justice source denied that the member limit was negotiated by Microsoft to stave off an injunction against Windows 95. —L. M.

(continued on page 53)

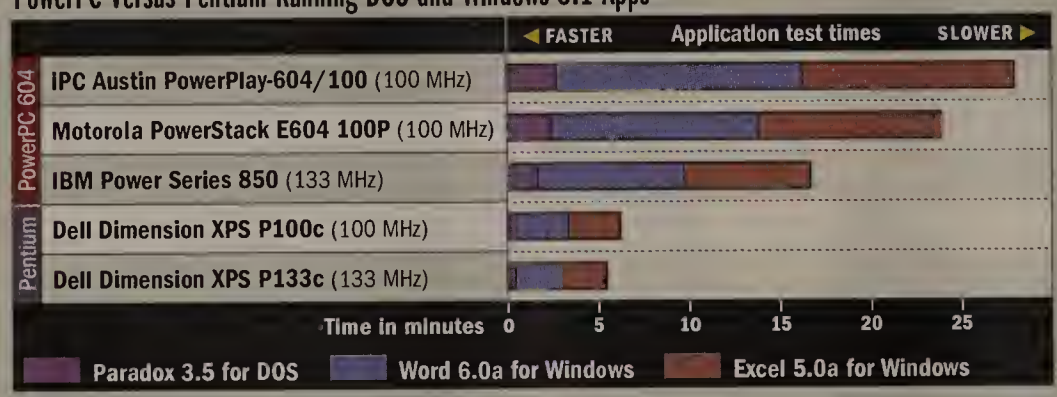
PHOTO: PIERRE-YVES GOAVEC; ILLUSTRATION: JEFFREY PELO

From Washington to Grant Faster Than a Speeding Pentium

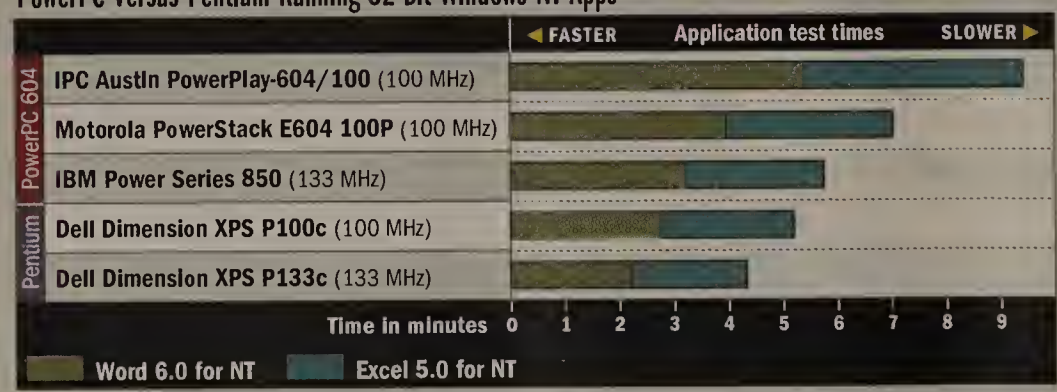
PowerPC systems can't run DOS and Windows 3.1 programs as fast as Pentium systems do, but they excel at the number crunching needed for special graphic effects like morphing and animation.



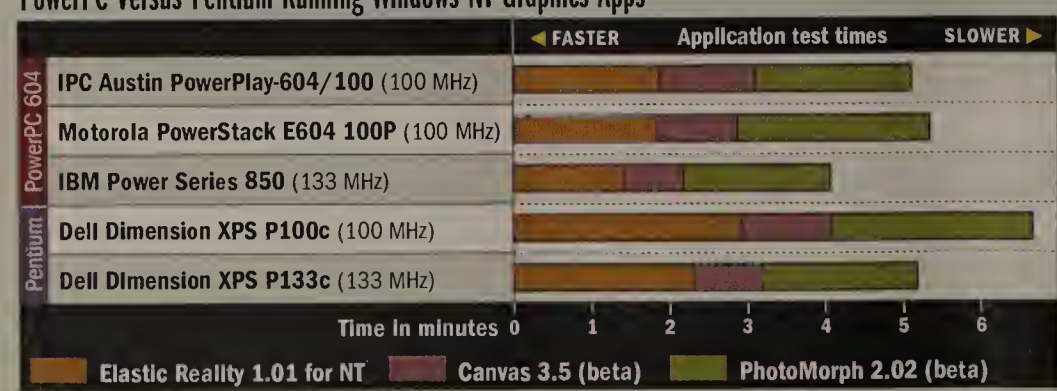
PowerPC Versus Pentium Running DOS and Windows 3.1 Apps



PowerPC Versus Pentium Running 32-Bit Windows NT Apps



PowerPC Versus Pentium Running Windows NT Graphics Apps



Methodology We ran tests on PowerPC and Pentium systems with Windows NT 3.51, 32MB of RAM, and 64-bit graphics accelerators with at least 2MB of DRAM. NT was loaded with the default installation. For all systems, we set the video at 800 by 600 resolution with 256 colors using the video drivers supplied with NT.

Our test suite included Borland's Paradox 3.5 for DOS, Microsoft Word 6.0a and Excel 5.0a for Windows, and the Windows NT editions—for both the x86 and PowerPC—of Word 6.0, Excel 5.0, Elastic Reality's Elastic Reality 1.01, Deneba's Canvas 3.5 (beta), and North Coast Software's PhotoMorph 2.02 (beta). The Paradox, Word, and Excel macros test various software functions; for more detailed descriptions, see "Is Windows 95 Faster?" in the August issue. For Elastic Reality, we created a 1-second .avi morphing video clip from two JPEG files. For Canvas, we timed the redraw of a 7MB vector-image file. For PhotoMorph, we created a 1-second .avi video clip from two JPEG files using the smudge transition effect. **Data based on tests designed and conducted by the PC World Test Center.** **All rights reserved.**

Windows NT. And once developers write software to work with Windows NT for the *x*86, the job of recompiling it to run on NT for the PowerPC won't be too tough.

To test how well PowerPC systems run 32-bit office productivity apps, we loaded them up with PowerPC versions of Word and Excel for Windows NT. For comparison, we ran the *x*86 editions of the same programs on the Pentium systems. While the PowerPCs fared better vis-à-vis the Pentiums than they did running DOS and Windows 3.1 apps, they still lagged behind. The 133-MHz IBM Power Series 850 took one-third longer than the 133-MHz Pentium to execute the combined Word and Excel macro scripts—and more than 10 percent longer than even the 100-MHz Pentium. The bottom line: In price/performance terms, the Dell Pentium-133 beat out the IBM system by more than 2 to 1.

Given that we were testing 32-bit programs built to run on Windows NT for the PowerPC, what accounts for the disappointing results? The answer boils down to optimization. Most commercial applications are written in high-level languages, yet certain key functions like scrolling, cursor movement, and recalculation are typically tuned for a specific processor (and often written in low-level machine language) to boost speed. Even after being recompiled for the PowerPC, applications that originated on the *x*86, such as Word and Excel, may not be optimized for the PowerPC. (Applications originally written for 16-bit Windows 3.1 also may not have been optimized for 32-bit Windows NT.)

This is a catch-22: Developers may not tune their programs for the PowerPC until the chip's sales are high enough to justify the extra work—yet lower performance from the PowerPC on mainstream apps like Word and Excel could turn users away.

Workstation-Class Systems

We expected the PowerPCs to zoom through advanced graphics applications that make heavy use of floating-point math, and we weren't disappointed. Two morphing packages used by animators to

Are PowerPCs Right for You?

If you use:	You should consider buying:
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multimedia development, graphics, math and statistics, 3-D, design and engineering, desktop publishing; Windows NT, OS/2	PowerPCs or Pentiums (or other *x*86 compatibles)

transform images—Elastic Reality (from the company of the same name) and North Coast Software's PhotoMorph—and a graphics and rendering program, Deneba's Canvas, all performed better on PowerPCs than on comparable Pentiums. The 133-MHz IBM PowerPC flew through tests of the three apps combined in three-quarters the time of the 133-MHz Pentium.

If you plan to use 32-bit applications that make heavy use of floating-point processing—such as digital video editing, 3-D rendering, animation, CAD, and engineering—the PowerPC becomes a more attractive option. It's a strong alternative to UNIX-based RISC workstations for those who primarily use high-end programs but also want to run 32-bit office apps and the occasional Windows 3.1 or DOS program.

Austin PowerPlay-604/100

Pricing: $4749
IPC Technologies, 800/752-1577, 512/339-3500
Reader service no. 852

IBM Power Series 850

Pricing: $7083
IBM PC Company, 800/426-4329

Motorola PowerStack Model E604 100P

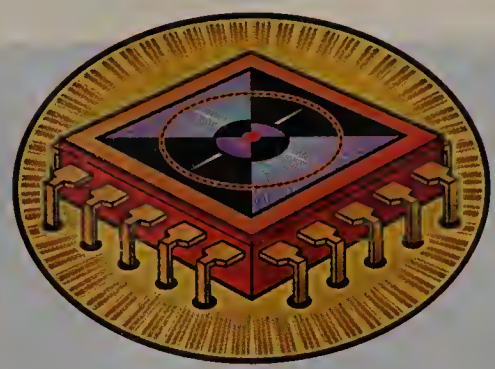
Pricing: $7794
Motorola Computer Group, 800/759-1107
Reader service no. 851

For now, PowerPCs will remain on the sidelines of the mainstream PC market. They don't offer enough bang for the buck to users who stick to DOS and Windows 3.1 apps, and the few Windows NT programs now available for the PowerPC need further optimization to perform as well as their Pentium counterparts. Of the three major suite vendors, only Microsoft has NT/PowerPC apps on the market. Novell won't have any 32-bit Windows apps for the PowerPC before mid-1996. And Lotus, despite being owned by PowerPC backer IBM, has no stated plans to develop SmartSuite for use with PowerPC systems.

Long-term prospects look more promising. As Windows NT gains acceptance, software developers and users will seek out the highest-performing platforms to run it on. IBM's PowerPC version of OS/2 is expected to ship before the end of 1995 and could boost interest in the platform. The makers of the PowerPC may soon deliver a rumored 615 version of the chip that incorporates an *x*86 core, allowing users to run *x*86 software without the performance penalty of emulation. And as multimedia continues to grow in popularity, demand for chips with the floating-point performance of the PowerPC will likely increase, sparking interest in consumer and mass-market PowerPC systems.

The wild card is Intel's next-generation P6 processor. Recent *PC World* tests (see "P6 Faster—and Slower—Than Pentium") show that the P6, like the PowerPC, also requires 32-bit applications to reach its full potential. As long as users continue to employ older DOS and Windows programs, both of these new chips could fail to garner much enthusiasm. But when developers and users make the leap to 32-bit software, both the P6 and the PowerPC will become more competitive with the Pentium—and with each other.

—Bryan Hastings



Breaking News

(continued from page 51)

AT&T PARES PC PRESENCE: The telephone giant will radically restructure its money-losing Global Information Solutions division (known as NCR when AT&T bought it for $7.4 billion in 1991), all but abandoning the retail sales channel. The move represents yet another setback in AT&T's quest for a greater presence in the PC business. Spokesperson Bob Farkas said sales, service, and support programs will continue without change for now, while the division focuses on what it sees as areas of potential strength: file servers and customers in the finance, retail, and communications sectors. Heavy layoffs may await the company's 42,800 employees. —J. A.

CHEAPER 1200-DPI PRINTERS ON THE WAY: Look for affordable, high-performance 1200-by-1200-dpi network printers in early 1996, thanks to QuickPrint, a new printer coprocessor from Peerless Systems in El Segundo, California. Printers using the chip can support higher resolutions and speeds at a cost comparable to that of today's 600-by-600-dpi printers, says Tom Ruffolo, vice president of marketing for Peerless, because QuickPrint reduces memory requirements and integrates functions usually found on several components. This is a welcome development, notes IDC analyst Angele Boyd, because corporate buyers are demanding higher res-

(continued on page 55)

JEFFREY PELO

PCs Take On a Third Dimension

Three-dimensional graphics are coming to a PC near you, and soon realistic shapes and animation could be as common as TrueType fonts. If you own a 486DX or Pentium system, you can already create eye-catching 3-D logos and graphics. Now, thanks to an array of new 3-D products, you can even perform some of the magic once restricted to CAD engineers and graphic artists with pricey Silicon Graphics workstations.

You'll see more than just flashy presentations: Imagine virtual reality without the goggles. You may be able to navigate a 3-D view of your office, click on a file drawer, pull out a 3-D graph and a dazzling logo, and drop them into a report. "It's even conceivable to extend the graphical user interface to have a 3-D metaphor," says Rick Silverman, vice president of marketing at graphics chip maker Trident Microsystems.

Until recently, PC users were hamstrung by their platform's inherent limitations. To fool the eye into seeing 3-D images—spheres, cars, landscapes, DNA strands, and so forth—on a 2-D screen, a PC has to pump loads of data from disk to memory to CPU, perform numerous complex calculations, and then pump it all back out to the graphics controller and monitor.

FULL-FEATURED PROGRAMS like Caligari's trueSpace2 let you create stunning, professional-level 3-D images.

Getting There From Here

Today's systems can handle the workload better. Intel's 486DX and Pentium chips have built-in math coprocessors that perform the floating-point calculations required to create 3-D models; VESA and PCI local buses use a 32-bit data path (instead of the ISA bus's 16-bit path) for moving large amounts of data straight to the CPU; and now 32-bit operating systems like Windows 95 and OS/2 have the potential to speed up software much as UNIX drives workstations.

Even with all these improvements, creating realistic 3-D effects still taxes your CPU. So 3-D accelerator chips from com-

Reality Check: Will 3-D Help You Make the Sale?

▶ **Name and title:** Mark Towler, business development manager, Phoenix Publishing in Monterey, California

▶ **1995 departmental PC budget:** About $200,000

▶ **PC:** Gateway 2000 ColorBook DX4-75 notebook

▶ **3-D software and presentation software:** Ray Dream AddDepth, Microsoft PowerPoint

▶ **Does 3-D make a difference?** "I wouldn't say using 3-D software helped us win the big account, but it has definitely grabbed and kept people's attention during business presentations," Towler says. "Whenever you put people in a dark room, you run the risk of someone falling asleep. I can spruce up text or a piece of clip art to create a more visually appealing presentation."

Towler no longer needs to purchase expensive clip art collections to liven up his presentations. "I've found it's not the graphic image itself, but the fact that it's in 3-D that gets people's attention," he says.

▶ **Are the tools hard to use?** "I've never had any problems getting my text or images to look right in AddDepth," Towler says. "I can transform a bland 2-D image into a snazzy piece of clip art just by adding some depth. When I'm done, I copy and paste the object right into my PowerPoint presentation." He does wish the program included more templates. "I prefer to start with an existing image and then customize it for my own needs," he says.

▶ **Towler's tip for nonartists:** Moderation is the key. While 3-D images can add a more polished look to presentations, it's best to use them sparingly. "If there are a couple of points in your presentation you want to hammer home, 3-D is a nice touch," he says. "Just be careful not to overdo it." —Cathy Kenny

panies like ATI, Cirrus Logic, Nvidia, and Trident Microsystems are making their way onto add-in cards that cost as little as $250. These chips lift some of the burden from the CPU, speeding up functions like *shading*, which throws light on an illustration to make it look 3-D, and *texture mapping*, which makes objects look like they're made of glass, brick, or other materials.

To take advantage of acceleration, graphics programs must be able to talk to the 3-D chip. That's where an application program interface (API) comes in. Several are now in use by vendors; they not only allow 3-D software to talk to 3-D hardware, but also make the software work faster. If you buy a 3-D accelerator, make sure it's compatible with all the standard APIs. Some of the most popular include Intel's 3DR, Criterion Software's RenderWare, and Argonaut Technologies' BRender.

But the APIs you'll hear about most in the coming months are those Microsoft is adding into Windows 95 and Windows NT: Direct3D for Windows 95, based on technology obtained when Microsoft bought RenderMorphics, and OpenGL for Windows NT, licensed from Silicon Graphics. Direct3D, designed for speed, is suited for games and business use, while OpenGL, designed for precision, is required for computer-aided design and other workstation-class graphics. OpenGL is included in Windows NT 3.5, and Direct3D is slated as a future add-on to Windows 95.

Inexpensive Routes to Snazzy 3-D Graphics

Tasks	Hardware options	Software options
basic drag-and-drop of 3-D objects, text extrusion for presentations and reports, minimal modeling	no special hardware needed	3D F/X ($79), AddDepth ($99)
advanced 3-D graphics design for creating walk-throughs, other more detailed models	3D Blaster ($349), Diamond Edge ($299), MGA Millennium ($379)	Designer 3 ($349), TriSpectives ($300), trueSpace2 ($795), Visual Reality ($259)

NO NEED FOR A WORKSTATION: 486DX systems with low-cost software and accelerator cards are enough to get started in 3-D.

JEFFREY PELO

The 3-D Marketplace

Matrox Graphics (800/361-1408) was the first vendor to make mainstream graphics boards with 3-D acceleration. In June it began shipping its $379 MGA Millennium, which supports all the major 3-D APIs, including OpenGL, and combines 2-D and video functions with hardware-accelerated shading and texture mapping.

Newer cards like the $299 Diamond Edge from Diamond Multimedia (800/468-5846) and $349 3D Blaster from Creative Labs (800/998-5227) focus on speeding up 3-D animation in Windows 95 and DOS games. Both boards make 3-D action characters and fighter planes move faster on screen. Without this acceleration, 3-D objects would appear as wireframe models while they rotated. In business applications these boards will let you manipulate 3-D charts quickly, or even walk through virtual buildings.

Making 3-D Models

Software vendors are racing to create easy-to-use 3-D programs powerful enough to produce stunning graphics. Since most business users don't have much experience in graphic design, vendors typically bundle in ready-to-use 3-D models and textures. For instance, Visual Software's (800/669-7318) $259 Visual Reality 2.0 includes nine CD-ROMs with 3-D scenes from which you can take objects, textures, backdrops, and animations for your own use.

Several business applications already include 3-D. Software Publishing's (800/234-5500) $149 Harvard ChartXL 2.0 for Windows 95 comes with more than 300 2-D and 3-D graph types that help you view data and visualize formulas. Add a 3-D accelerator, and you can rotate graphs in real time to examine the data. All that's left is to export the 3-D graph to a presentation.

Breaking News

(continued from page 53)

olution and speed from their printers. Likely Peerless customers include Canon, Xerox, and IBM. —A. F.

THE SOCIABLE PC: The latest "social interface," or pictorial environment for selecting apps and arranging files on PCs, comes from Midisoft of Issaquah, Washington, a company known mainly for its music software. MediaWorks (for Windows 3.1 or 95) combines communications and multimedia functions such as E-mail, fax, voice mail, modem software, speech recognition, and video/audio recording and playback. Look for the software to be bundled on all new NEC multimedia PCs this fall. —A. R.

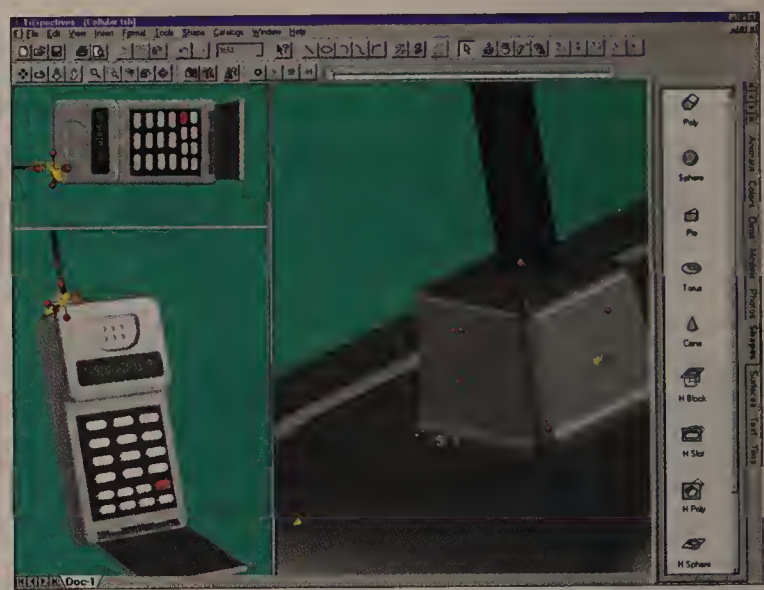
MONITOR MEASUREMENTS: A draft complaint leaked by the California attorney general's office cites some of the biggest names in the computer business for exaggerating the usable screen dimensions of their monitors. The complaint asks vendors to provide both physical and usable screen measurements for monitors, and to assign model numbers in sync with sizes. The attorney general's office told *PC World* that it aims to pursue the complaint, but observers predict settlement out of court. Companies listed include Acer America, AST Research, Dell, IBM, Leading Edge, NEC, Packard Bell, and Tandy—but being named doesn't indicate wrongdoing. —J. A.

Edited by Andy Reinhardt

Users who want to venture beyond 3-D charts can choose from several programs costing under $100. These perform well on 486DX and Pentium systems but also benefit from a 3-D accelerator. Asymetrix's (800/448-6543) $79 3D F/X for Windows 3.1 lets you create 3-D graphics by dragging and dropping objects into a scene. It also lets you *extrude* text (make it 3-D) for use in logos and presentations. The package comes with more than 300 models, shapes, scenes, and textures that you can modify with lighting, warping, and other tools. 3D F/X also supports OLE 2.0, so you can place objects in PowerPoint, Word, or any other OLE-compliant program.

Another entry-level package is Ray Dream's (800/846-0111) $99 AddDepth for Windows 3.1, which guides users through the creation of 3-D effects. The program isn't as robust as 3D F/X, but it's easy to use for extruding type and line drawings. You can export your creations to almost any word processing, publishing, or presentation graphics program. (Ray Dream's full-featured Designer 3 modeling package is $349.) The new $695 CorelDraw 6 for Windows 95 (800/772-6735) also supports 3-D capabilities, combining Corel Presents multimedia graphics with technology based on AddDepth and Designer.

People with more artistic talent might consider 3D/Eye's (800/946-9533) $300 TriSpectives for Windows 95, which includes 1000 objects that reposition themselves when dropped on one another. You can use TriSpectives to create 3-D scenes without an accelerator, thanks to the SmartRender feature, which automatically switches between wireframe and rendered models. A $500 TriSpectives professional version includes CAD functions.

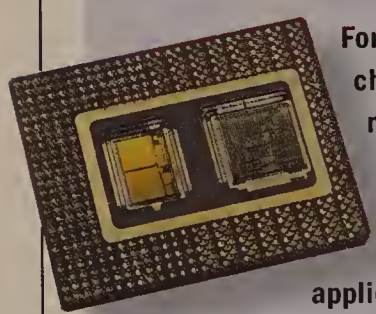


3D/EYE'S TRISPECTIVES PROFESSIONAL includes some CAD features to help design and visualize products in 3-D.

Caligari's (415/390-9600) $795 trueSpace2 is a 32-bit app for Windows 3.11, 95, or NT that resembles workstation-class 3-D programs. Besides offering a huge array of modeling and animation tools, trueSpace2 lets you use Photoshop plug-ins.

—Brad Grimes

P6 Faster—and Slower—Than Pentium:



For the first time since Intel began selling *x*86 chips, the newest member of the family, codenamed the P6, won't necessarily run your existing software faster than its predecessor, the Pentium. Instead, the P6 is optimized to run emerging 32-bit operating systems and applications. This means that users of older DOS and Windows software won't see a speed boost from switching to the P6, and some Windows 95 users may not gain enough performance to justify the extra cost of early P6 systems.

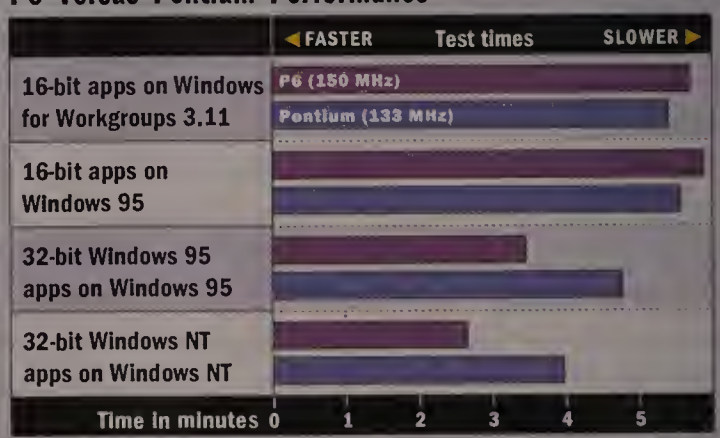
Tests we performed highlight this startling fact. On a prototype P6 system running at 150 MHz—the slated entry-level speed for the chip—made available to our Test Center by Intel, we found that macros for 16-bit Word and Excel actually took *longer* to run under Windows 3.11 and 95 than they did on a 133-MHz Pentium.

P6 performance improved as *PC World*'s tests progressed from 16-bit applications and environments to 32-bit software. The Windows 95 versions of Excel and Word running on Windows 95 took 28 percent less time to complete our tests on the P6 than on the Pentium. These results were surpassed by the true 32-bit Windows NT and NT versions of Word and Excel, which together took 33 percent less time on the P6 than on the Pentium. This is a bigger jump than the difference in clock speed alone would explain.

Why would a faster processor run some software slower? The answer traces to which operations the chip is optimized to perform. To boost speed, the P6 tries to predict the flow of program execution—a technique that works well for new 32-bit code. But 16-bit programs tuned to older processors can throw off the predictions and drag down P6 performance. Code in the Windows 3.1 graphics engine is especially prone to confounding the P6, Intel says.

Will the P6 fuel demand for Windows NT? Or will Windows 95's success delay demand for the P6? Stay tuned. —Andy Reinhardt

P6 Versus Pentium Performance



Methodology We ran Word and Excel macros and summed their timings to produce a single overall score. Tests were conducted on an Intel 150-MHz P6 prototype and a Dell Pentium-133, each configured with 32MB of RAM, 256K of secondary cache, a 230MB SCSI hard drive, and an ATI Mach 64 graphics controller with 2MB of VRAM and video resolution set to 800 by 600 with 256 colors. **Data based on tests designed and conducted by the PC World Test Center. All rights reserved.**

JOHN GREENLEIGH

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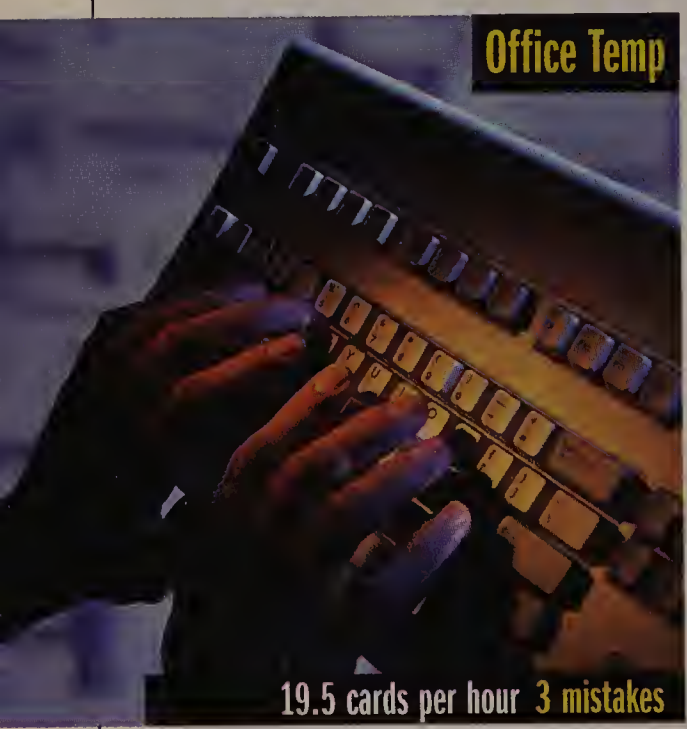
The Great Card Scanner Face-Off

TEST DRIVE ▶ Some office tasks are so monotonous and time-consuming that anybody would happily turn them over to a PC. Take, for instance, the mind-numbing job of entering information from business cards into a database.

Unfortunately, when business card scanners hit the market in 1993, they were slow, inaccurate, and often hard to install—if anything, even less appealing than old-fashioned typing. That may explain why many early entrants, such as Pacific Crest and Microtek, are no longer in the market.



Now Corex Technologies has introduced CardScan Plus PP, a $299 unit that uses improved hardware and software (version 2.0, also available for $99 for use with other scanners). Since this is the second generation of card scanning technology, we thought it was time for another look.

To give the device a real-world workout, we hired a temporary worker and timed how long it took him to enter the data from a stack of business cards into a PC. First he typed info into the Rolodex-like CardScan database. Then he used the miniature scanner to enter the same cards into an identical database. Our goal was to find out which method was faster and more accurate. Several *PC World* editors also took the same challenge.

The result was nearly a tie: Our temp needed the same amount of time to enter cards via the scanner and proofread the results as he did to type them by hand—on average, 3 minutes per card. (Depending on your perspective, this is either bad news for business card scanners or good news for temporary office workers.) A *PC World* editorial intern was actually able to enter cards about 25 percent faster by typing (averaging 1.5 minutes per card) than by scanning (averaging 2 minutes per card, including proofing). And even after the temp corrected his scanned entries, there were more errors in the database of scanned cards than in the hand-entered database.

Easy, Easy, Easy

CardScan Plus PP, which takes up no more room than a club sandwich and attaches to a parallel port, is an undeniably ingenious gadget. There's no power switch or special scanning syntax to worry about—you simply insert a card, and the CardScan hardware grabs it and processes it.

Using optical character recognition, the software converts the card's information into editable text, then searches for familiar words (such as job titles) to help it identify the person's name, title, address, and other details. It then deposits this data in its contact database. You can also transfer data into personal information managers such as Act, Ecco, and other programs.

Scanning and recognition together take about 9 seconds per card, and you can scan in multiple cards (one by one) before converting them. Compared to earlier products, CardScan 2.0 is impressively clever at identifying the components of a card and putting them into the correct fields of the database. In some cases, it even correctly read handwritten ink notations. While it didn't always interpret phone and fax numbers correctly, its mistakes were easy to spot, and it didn't make subtle errors such as inserting incorrect digits into a number.

The catch is that we still needed to carefully check CardScan's work, since it interpreted fewer than 20 percent of the cards without error. Its efforts at transcribing sometimes resulted in gibberish, especially on cards with unorthodox layouts and funky typefaces. (You couldn't dream up a

worse challenge for recognition software than to read something purposely designed to be as distinctive as a business card.)

Correcting CardScan's mistakes isn't hard, since the software uses an elegant drag-and-drop interface that lets you efficiently shuffle incorrectly placed data into the appropriate fields. It does take time, though—nearly as much, in some cases, as typing in all the information yourself.

In the end, all of our testers agreed that using CardScan Plus PP was more fun than typing, even if it didn't make them more productive. But if you're searching for an effortless way to get names and addresses off business cards and into your PC, your answer still hasn't quite arrived.

—Harry McCracken

CardScan Plus PP

Pricing: $299 direct from Corex; software only, $99
Corex Technologies, 800/942-6739
Reader service no. 833

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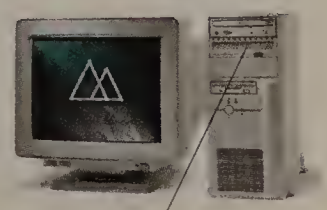

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Travel Deals Only a Mouse Away

Business travel costs can spin out of control faster than a New York cab driver. In fact, American Express Travel Services estimates that in 1994 U.S. companies spent $136 billion in travel, or an average of more than $3000 per employee—three times what they did a decade ago. Then there are other costs, like the time employees waste playing phone tag with travel planners. But new online services and PC software are now making planning easier and travel cheaper.

These products are superior to the no-frills airline reservation systems previously offered by online services or available on the Internet. They save time by letting you find and book your own air, hotel, and car reservations—sometimes all from one screen. Their interfaces are easy to use. Search features save you from scrolling through screens of data to find the lowest rates. And some services even let you buy through your own travel agent.

Aside from the savings you may realize from booking travel using these services, they can also improve your tracking and analysis of travel expenses. Reporting features let companies better manage costs and identify frequently used vendors to negotiate discounts.

First-Class Online Planning

Travelogix Online is one of the most flexible travel planning services available today. Once you've located an appropriate flight, hotel, and car for your trip using Travelogix's speedy search features, you can book your trip online through an affiliated travel agency, which sends you tickets overnight. Or you can fax or E-mail an itinerary from Travelogix to your preferred travel agent by clicking an icon. (You set the address when you install Travelogix software and sign on with the service.) Helpful extras include weather information and destination maps.

Travelogix saves time "and a lot of frustration," says Pam Stewart, an executive assistant at Arthur Andersen in San Francisco who's been using it for six months. "We have five travel people. Before, you'd call them—just to get flight information—and get their voice mail." Travelogix has stopped the phone tag, she says.

Travelogix costs $9.95 per month, with 60 minutes of free online time; each additional minute costs 18 cents. Your first month (with 60 minutes of online time) is free. New add-ons from Travelogix, set to ship in November, will help companies better contain travel costs. A preferred-vendors module will direct users to negotiated airfares and hotel rates. Another module will let a company post a corporate travel policy on Travelogix so employees can consult it. Pricing for these add-ons was not available at press time.

NO MORE PHONE TAG: Pam Stewart values Travelogix.

Go Wireless

Official Airline Guides offers OAG FlightLine, an online service that has airline information but no booking capability. It costs $3 per call; volume discounts are available.

By the end of the year, FlightLine will let you research and book flights wirelessly using a notebook PC with a wireless modem or a handheld like the Motorola Envoy, says OAG senior vice president and CIO Mel Trudeau. This means you'll be able to make or change airline reservations even when you're away from a phone. FlightLine will search for the best fare, present you with options, then book tickets

Earn More Frequent Flier Miles

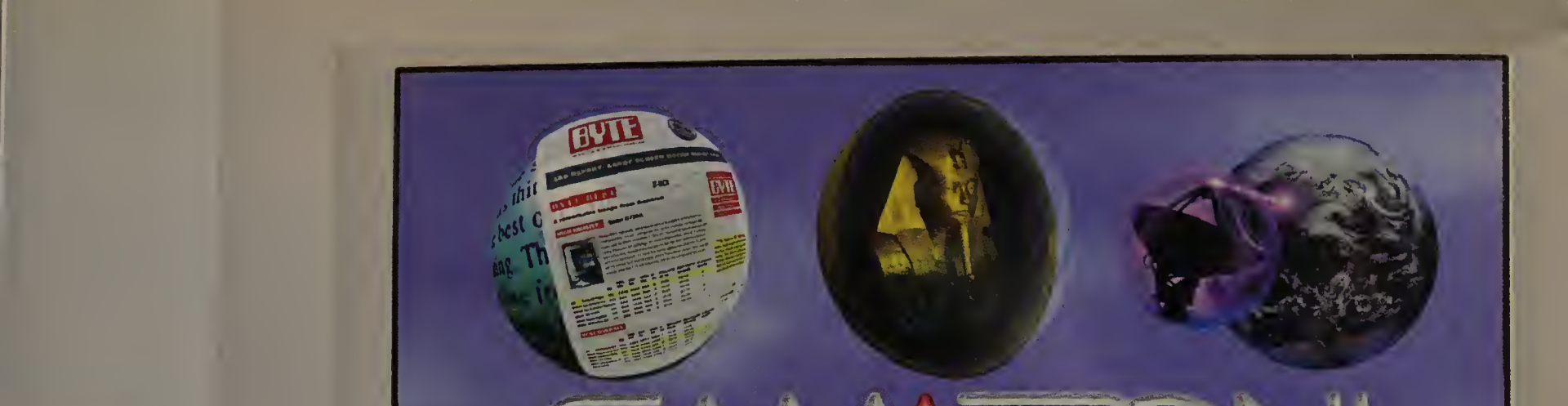
Forget a white Christmas: I'm dreaming of a free vacation. But this dream won't come true unless I organize the pile of statements and brochures from frequent flier, hotel, and car rental rewards programs that's taking over my desk. Even worse, I'm losing valuable freebies because I can't remember which hotels and car companies match up with which airlines. (It's not always convenient to review this information with hotel reservations staff.) But now Frequent Travel Management's FTM AirMax (for Windows 3.*x* and 95) can help. It organizes all that information, which can lead to more miles per trip and more awards.

This $50 program contains information on more than 30 travel incentive programs sponsored by airlines in partnership with hotel chains, car rental agencies, and credit card companies. FTM AirMax also provides information on awards, bonuses, start and end dates, and promotions.

I like the software's simple interface. You enter your airline, itinerary, and dates, and the program quickly calculates all frequent flier miles that can be earned. It also displays hotel and car partners that could be used to earn extra miles. All the data is presented on one screen for easy decision making.

While some online services offer downloadable programs that help you track frequent flier miles, we found no other product that coordinates all the information as this one does. Because programs change so fast, FTM also offers quarterly updates via disk or online. For information, call 800/386-2476. Reader service no. 839

PHOTO: ANDY FREEBERG; ILLUSTRATION: GORDON STUDER



Window To Your Mind's Eye

INSTANT INFORMATION BY FAX. CALL 1-800-525-8196.

Samtron's 17" monitors offer pictures so crisp, so clear, they truly provide a window to your mind's eye. Winner of *Byte Magazine's* Best Monitor Overall for Image Quality award, praised by *Windows Magazine* ("You'll Like What You See") and highly recommended by *PC Digest & Ratings Report*, Samtron's 17" monitors offer flicker-free resolution, sharp edge-to-edge focus and energy-saving features perfect for the home or office.

And they just got better. Our next generation of 17" monitors, the SC-728FXL and SC-726GXL, feature digital on-screen controls, ergonomics and 15.7" viewable, flat-square screen displays with fine dot pitch. Plus, they're both Plug & Play compatible making them ideal for use with Windows 95. In addition, both models offer Dynamic Focus for maximum clarity, INVAR Shadow Masking for increased brightness with less distortion and a ClearScreen Coating™ which reduces screen glare, eyestrain and fatigue. All this, and a limited 3-year warranty, at pleasantly competitive prices.

For more information on these models and our full line of 14," 15" and 20" high-quality monitors, contact Samtron today. We'll open up a window of possibilities, and give your mind's eye a better view.

SAMTRON, 18600 Broadwick Street, Rancho Dominguez, CA 90220
PHONE: (310) 537-7000, FAX: (310) 537-1055, TECHNICAL SUPPORT: (800) SAMTRON

The EPA Energy Star emblem does not represent EPA endorsement of any product or service. All product names are trademarks of their respective companies. ©1995 SAMTRON. ClearScreen Coating is a trademark of Samtron. Floorplan image courtesy of BAGH Technologies

PLUG & PLAY

NUTEK

SAMTRON

Circle 213 on reader service card

Resellers circle 204 on reader service card

for you. Eventually, Trudeau says, you'll be able to book through your own travel agent. The catch: You must be in an area served by wireless carriers like Ardis, Ram Mobile Data, or CDPD. The new service's price was not set at press time.

For people who don't need to go wireless, OAG will offer a cheaper online service in early 1996. This will include goodies like maps and weather data.

Air Travel Manager Professional

Pricing: $99
Personal ExpertWare, 800/451-9273
Reader service no. 834

ExpressNet

Pricing: Free through AOL
American Express, 800/297-1234
Reader service no. 835

OAG FlightLine

Pricing: $3 per call
Official Airline Guides, 800/525-1138
Reader service no. 836

Resolution 2.0

Pricing: Transaction based
TravelNet, 408/774-6200
Reader service no. 837

Travelogix Online

Pricing: $9.95 per month
Travelogix, 800/815-6449
Reader service no. 838

AOL and CompuServe Upgrade

American Express has a new ExpressNet forum on America Online. Any AOL member can research trips, and AmEx cardholders can make air, hotel, and rental car reservations. They can also check their account status, download monthly statements into Intuit's Quicken personal finance software, and pay bills online.

For CompuServe members, Personal ExpertWare has introduced a new version of Air Travel Manager (AirTM) Professional, a front end to the somewhat unfriendly Eaasy Sabre airline reservation system. This update adds hotel and car reservations. A noteworthy feature: rebates of $25 on airline tickets costing $500 or more, or 5 percent on tickets under $500. You must book through Personal ExpertWare's agency, Rosenbluth International. The software costs $99 and requires CompuServe membership. The new version is free to current AirTM users. CompuServe users can download it for a free trial (**go airtm**).

EASIER TRAVEL PLANNING: Travelogix Online lets you book flights, hotel rooms, and car rentals without picking up the phone.

Going First-Class: TravelNet

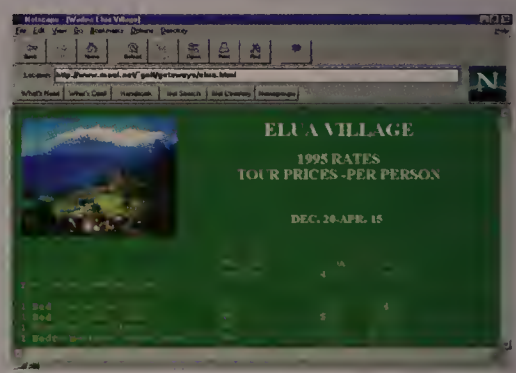
For a look into the future, check out TravelNet's Resolution 2.0, a client-server software system that could change the way large companies plan and manage travel. Shipping since June, the product lets employees plan and book their own travel via links to information and reservation systems. It tracks purchases, helping travel managers negotiate better airfares and hotel rates. Reporting features enable department managers to track and analyze travel spending.

TravelNet sells the software, server, installation, and training all together and meters usage at $7 to $10 per transaction.

—Laurianne McLaughlin

The Web Browser: The Virtual Travel Agent

The Web can be a globe-trotter's best friend. Going overseas? Start with State Department Travel Advisories, a site that combines consular reports with international maps. http://www.stolaf.edu/network/travel-advisories.html...My favorite kiosk for general information is the GNN Travelers' Center, a compendium of links, tip sheets, and planning aids for domestic and international travel. http://nearnet.gnn.com/gnn/meta/travel/index.html...The Airlines on the Web page provides links to almost every airline imaginable, many of which are on the verge of providing their own online ticketing services. http://haas.berkeley.edu/~seidel/airline.html...Alamo Rent a Car is the first agency to provide auto rental on the data highway; its site also includes maps and weather information. http://www.freeways.com/...You can drive that rental car to the local Hilton after you've reserved your room using an intuitive interface that lets you search for Hilton hotels by location. http://www.hilton.com/...With the help of Web resources, you'll arrive in style. Now you can just kick back and hope there aren't any delays on the real highway. —Richard Overton



LINKS TO THE LINKS? New Haven's Golf Getaways leads tours to some of the dreamier greens, many of which are featured at http://www.maui.net/~golf/getaways/.

Something
for
Everyone.

Something for the Road.

AcerNote Keeps Your Business On The Move

Because business is becoming so diverse and mobile, you need a vendor that can meet your needs both in the office and on the road. For the past 15 years, Acer has been developing a complete range of affordable Pentium® processor driven solutions that will keep your business moving forward no matter where it takes you.

AcerNote™ Pro Docking Station

Docking Station Features Include:

- 200 Watt Power Supply
- Quad-Speed CD-ROM Drive
- 2-Button Mouse
- Stand Alone Speakers
- Standard Keyboard
- 3 ISA Expansion Slots, 3 Storage Bays (1 Internal/2 External)
- Removable Top Cover for External CRT
- Battery Charger Bay to Recharge Batteries During System Use

$799

Business Leasing Available

At the office:
Now you can connect to a docking station for full PC power including CD-ROM, and recharge extra batteries simultaneously.

On the plane:
For extra-long life, swap the floppy drive and internal AC adapter modules with the Nickel Metal Hydride (NiMH) and lithium ion battery packs.

At the hotel:
Use the built-in PCMCIA port to fax or modem. To recharge while you work, swap out the internal AC adapter for a battery pack, using the AC adapter externally.

For a retailer or reseller near you,

Call 800-529-ACER

Cards Welcome

*Acer preinstalls Microsoft Office v4.2 on select AcerNote products with at least 8MB of RAM and a hard drive.

Please call 1-800-574-ACER for details on the money-back guarantee and limited warranty. Return shipping and insurance charges are the responsibility of the customer. Not available in Canada. On-Site service may not be available in certain remote locations. Products, availability, prices and programs are subject to change or cancellation without notice. Shipping and handling charges are extra. Acer and the Acer logo are registered trademarks and AcerNote is a trademark of Acer America Corporation and Acer Inc. Intel, the Intel Inside logo, Pentium and the Pentium Processor logo are registered trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. ©1995 Acer America Corporation. All rights reserved.

AcerNote Pro P75MHz

- 75MHz Intel® Pentium Processor
- **8MB System RAM (Expandable to 40MB)**
- **10.4" Dual-Scan LCD Displays 256 Colors**
- Externally Removable 800MB 2.5" Hard Disk Drive
- 2 PCMCIA Type II/1 Type III Slot
- Built-In Touchpad Pointing Device
- Externally Removable 1.44MB Diskette Drive
- Dual-Battery Operation
- Secondary Lithium Ion Battery Option (When Available)
- 1MB PCI Bus Video with Graphics Accelerator
- **16-Bit Sound Blaster™- and Windows® Sound Systems-Compatible Stereo Audio Onboard with Built-In Speaker and Microphone**
- Full-Sized 82-Key Keyboard
- Simultaneous Notebook Display and External Monitor (CRT) Support
- Separate Status LCD Display
- Slim 8.97" x 11.7" x 1.97" System Case Weighs 6.4 lbs., Including NiMH Battery
- Personal Organizer and Hoyle® Classic Card Games Included
- **Microsoft Windows 95**
- **Three-Year Limited Warranty with One-Year Next-Business-Day Replacement in U.S. and Canada**

$2,899

Business Leasing Available

AcerNote Light 75MHz

- 75MHz IntelDX4™ Processor with Built-In 16KB Cache
- **8MB System RAM (Expandable to 32MB)**
- **10.4" Dual-Scan LCD Displays 256 Colors**
- 420MB Upgradable Hard Disk Drive
- 1 PCMCIA Type II Slot (1 PCMCIA Type III Slot Module Available as Accessory)
- Built-In Touchpad Pointing Device
- 1MB Video Memory
- Secondary Lithium Ion Battery Option (When Available)
- Simultaneous Notebook Display and External Monitor CRT Support
- **Slim 8.2" x 11.7" x 1.7" System Case Weighs 5.0 lbs., Including Duracell® NiMH Battery**
- Full-Sized 82-Key Keyboard
- Personal Organizer and Hoyle Classic Card Games Included
- **Microsoft Windows 95**
- **Three-Year Limited Warranty with One-Year Next-Business-Day Replacement in U.S. and Canada**

$2,199

Business Leasing Available

AcerNote Pro P75MHz

- 8MB System RAM (Expandable to 40MB)
- 10.4" Active-Matrix LCD Displays 256 Colors
- Externally Removable 500MB 2.5" Hard Disk Drive
- **Microsoft Office v4.2***

$3,999

Business Leasing Available

Acer Service And Support

- 30-day money-back guarantee
- Three-year limited warranty. First year, toll-free technical support 24 hours a day, 7 days a week. Years Two and Three, Carry-In or Mail-In to an Authorized Service Provider
- Next-Business-Day Replacement in the U.S. and Canada

For immediate delivery,

Call 800-574-ACER

Monday through Friday 6 AM-6 PM and Saturday 8 AM-4 PM Pacific Time. Acer computers are also available at fine retailers and resellers. (Acer computers with Microsoft Office preinstalled are not available at Acer Authorized Retailers.)

When calling, please reference #105 ACD. Specifications and pricing are subject to change. Prices valid through October 31, 1995.

Circle 229 on reader service card

"TrackMan Marble never needs cleaning. It fits the way I work. I love it!"

Barrimore Zarsprach
Automotive Designer

SOFTWARE TO SAVE YOU TIME
Easily programmable buttons convert time-wasting stuff like double clicks, draglock and repetitive menu selections into speedy single clicks.

SHAPED TO KEEP YOU COMFORTABLE.
As your hand rests here, your thumb alights naturally on the Marble™ Trackball.

GUARANTEED NOT TO LET YOU DOWN
Behind the best warranty in the industry stands the company that makes the mice and trackballs people love most.

BREAKTHROUGH TECHNOLOGY ELIMINATES CLEANING PROBLEMS.
Marble™ doesn't have mechanical rollers that get jammed by dust and dirt as in other trackballs. Instead, patented electronic sensors track the ball's slightest movement with reliable precision.

TrackMan® Marble is the latest in the world's most loved line of mice. All offer unique three button functionality and are guaranteed by the world leader in pointing devices: Logitech. Call **1-800-732-2923** for more information, or for information by fax, call **1-800-245-0000,** Document 4026.

WINDOWS® 95 COMPATIBLE

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Circle 241 on reader service card

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Tadpole P1300: First 133-MHz Pentium Notebook

Cruising by the old speed limits, Tadpole Technology has introduced the first notebook with a 133-MHz, 3.3-volt Pentium processor. With a 10.4-inch active-matrix screen, PCI bus video, and hard drive storage up to 1.2GB, this 7.5-pound portable could make some desktops look like clunkers. But all that speed comes at a premium: The P1300 with a 340MB hard drive starts at a whopping $6995 on the street. Moving up to a 1.2GB drive and 16MB of RAM will cost $8395 on the street.

Tadpole designed the P1300 for data-intensive or graphics-intensive applications such as 3-D modeling, presentations, and complex multimedia work. If you must run these applications while you're away from the office, you need a notebook like the P1300 that's as powerful as a desktop. This note also provides top speed for mobile types who want to run a 32-bit operating system.

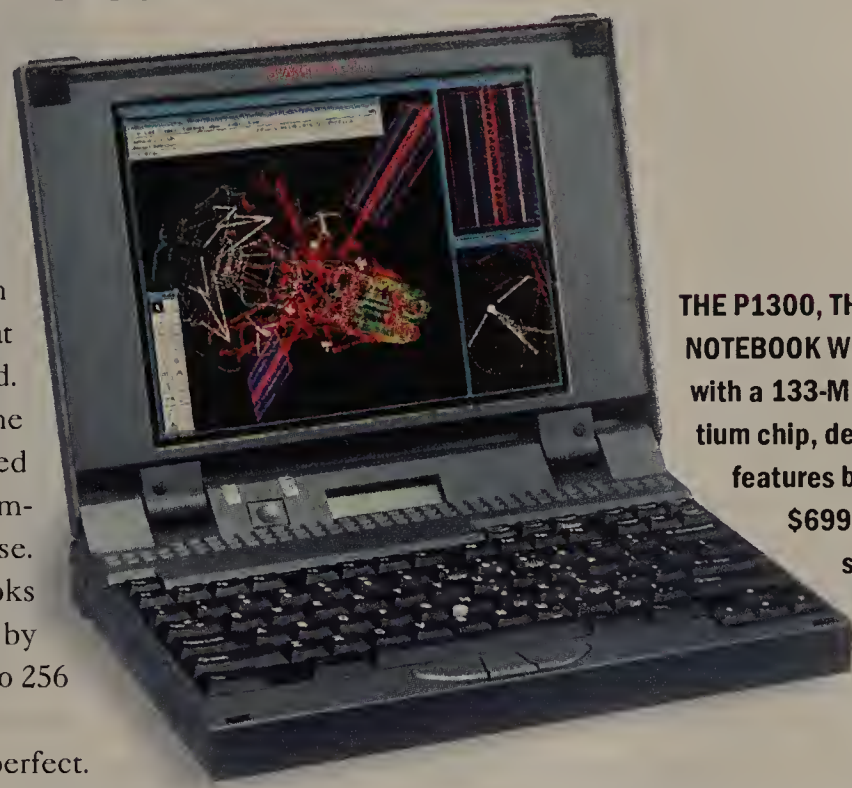
We examined a prototype unit, though it was not available for a full round of speed testing. The sturdy magnesium alloy case measures a reasonable 11.8 by 8.5 by 2 inches, which is comparable to other notes with similar 10.4-inch active-matrix screens. The external 3½-inch floppy drive can be left at home when not needed. Also on the plus side, the keyboard and integrated pointing device are comfortable and easy to use. The large display looks good and supports 800 by 600 resolution and up to 256 colors simultaneously.

But the P1300 isn't perfect. It's rated for only 1.5 hours of typical use with the included NiMH battery. If battery life is crucial, consider the optional ($450 list price) external NiCd battery pack, which the vendor says lasts up to 6 hours. Another drawback is the PC's weight with the floppy drive and AC adapter: a hefty 9 pounds.

The P1300 became hot during testing, which involves typical business apps. Tadpole says our trouble was due to the fact that this was a prototype and consumers should not have this problem with the final product, which may sometimes feel "warm" but not hot.

The P1300 is upgradable to 128MB, with a 256K secondary write-back cache. It offers the usual ports but no serial port; to get one, you must pay $249 for a mini–docking station. This station also has interfaces for stereo audio in/out and for an external keyboard. The note's PC Card slot holds one Type III or two Type II cards.

—Laurianne McLaughlin



THE P1300, THE FIRST NOTEBOOK WE'VE SEEN with a 133-MHz Pentium chip, delivers top features but costs $6995 on the street.

Tadpole P1300

The first Pentium-133 notebook boasts a 10.4-inch active-matrix display, plenty of storage—and a high price.

Tadpole Technology
800/232-6656,
512/219-2200
Street price: Starts at $6995
Reader service no. 609

Power-Packing PCs With Fast RAM

Digital's Celebris GL PCs offer power, networking, and high-end graphics capabilities—ideal for running 32-bit Windows 95 apps.

The 100-, 120-, and 133-MHz Pentium models come with 16MB of EDO memory, the fastest RAM available. The 90-MHz Pentium model has 8MB of nonparity RAM. Other high-performance hardware includes 256K of pipeline-burst cache and Intel's Triton chip set. While the Celebris GLs weren't available for testing, PCs we've seen with these features rank among the fastest.

Digital adds easy network connectivity through integrated 32-bit PCI Ethernet LAN circuitry and high-performance graphics capabilities via an integrated 64-bit MGA Millennium card with 2MB of dual-ported Windows RAM, which is faster and cheaper than VRAM. The PCs also offer a quad-speed CD-ROM drive.

These systems don't come cheap. The GL5120 including a Pentium-120 CPU, 16MB of EDO RAM, a 1GB hard drive, and a 17-inch monitor is $4728, on the high side for a P-120.

—Arden M. Hoffman

Digital Celebris GL line

These Pentium-based systems promise power and efficiency—ideal for running Windows 95.

Digital Equipment Corp.
800/642-4532,
508/624-6400
List price: GL590 $3218, GL5100 $3868, GL5120 $4728, GL5133 $4518 (all with monitor)
Reader service no. 610

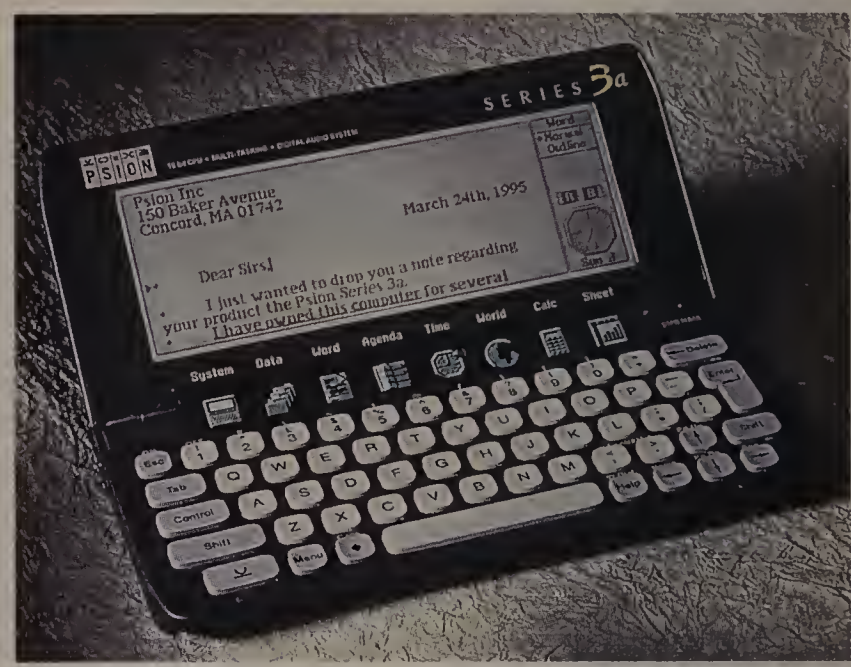
New Software Makes This Handheld a Standout

Moving data back and forth between a handheld system and a PC has always been a pain. Printing from a handheld has been at least as aggravating. That's about to change with the release of Psion's new utility software, PsiWin, which makes Psion's Series 3 and 3a lines of handhelds the most usable on the market.

PsiWin resembles Windows for Workgroups' File Manager and lets you quickly drag and drop files between your Psion handheld and PC drives via a bundled serial cable. PsiWin can be set to automatically convert proprietary files created on the handheld into common Windows application file formats and vice versa. For example, you can set the Psion 3a to convert its word processing files into Word, WordPerfect, or Ami Pro formats. There are also conversions for spreadsheets, database, and personal information manager formats. Prior to this advance, you had to save documents as text files before exporting them to a PC, which meant you had to import and reformat your data.

Printing from a handheld PC has never been easy because handhelds typically have only serial ports. Printing via these ports was clumsy and time-consuming. A better idea was to attach the handheld to a PC and print from the PC, but that was just as clumsy. PsiWin addresses this problem by simplifying the process and eliminating some steps. What's more, once you've hooked your handheld up to a PC, you can access the TrueType fonts installed on the PC's hard drive. Quite an improvement—previously, handhelds could only print fonts resident in the printer.

—Michael Lasky



WHAT A DIFFERENCE SOFTWARE MAKES: New utilities let the pocket-size Psion 3a transfer files to a desktop PC with ease.

PsiWin Software for Psion Series 3 and 3a

New utilities that make these handheld computers among the best.
Psion Inc.
800/997-7466, 508/371-0310
Street price: With serial cable $99
Reader service no. 612

Lowest-Priced 30-Bit Scanner

Professional-quality, single-pass flatbed color scanning just became affordable. Tamarack Technologies has announced the $699 Tamarack Z1-600, the first 30-bit, 300-by-600-dots-per-inch scanner we know of that sells for less than $700—a new low. Prices have been dropping steadily; until recently, 30-bit color scanners were priced in the $2000 range.

In addition to being the first 30-bit scanner at this price level, the Z1-600 is the first scanner to use advanced ASIC technology, which improves the product's speed and color accuracy and decreases its power consumption. Design professionals choose 30-bit color scanners because the greater color depth translates into images that have greater clarity and more detail than those scanned with less precise 24-bit devices: 30-bit images look more like the original, and the designer spends less time touching them up.

Connecting the Z1-600 to a computer is relatively painless. It comes with a SCSI card that plugs into any 16-bit expansion slot, but it will also work with an Adaptec ASPI-standard interface card. Tamarack warns users about hardware conflicts in systems with add-ons such as CD-ROM and external drives, but my system has both and I didn't experience any hardware problems.

Getting the scanner to work with software is another story. The included Adobe Photoshop Limited Edition, a "light" version, froze my mouse—the software didn't work with the latest version of Microsoft's mouse driver, so I had to load another driver. (The Z1-600 is also bundled with an OCR package, Image Recognition Integrated Systems' Readiris OCR.) Although the company claims that all TWAIN-compatible applications work with its product, both Microsoft Imager and PhotoMagic LE froze when I tried to use them with this scanner.

Several calls to technical support eventually ironed out my problems, but let the plug-and-play enthusiast beware. This 30-bit scanner may sell for a desktop price, but it takes more than desktop skills to get it up and running.

—John Mello

Tamarack Z1-600

Affordable 30-bit scanning.
Tamarack Technologies
714/744-3979, 714/744-4582 (fax)
List price: $699
Reader service no. 611

FOR THE LAST TWO YEARS
WE'VE WORKED WITH MICROSOFT
TO MAKE SURE WINDOWS 95 USERS
GET WHAT THEY NEED.

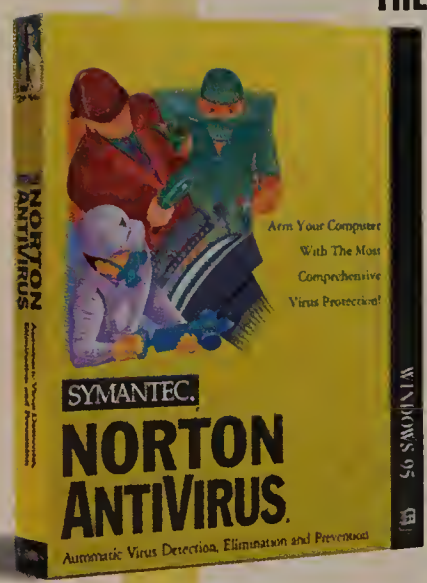
SYMANTEC.®

PREVENTION, PROTECTION
WINDOWS 95

You've waited. And waited. And now it's here. The most powerful PC operating system known to man and mouse.

But before you settle down to work in the 32-bit world of Windows 95, there are a few things you should know.

INFECTION PREVENTION IN THE NEW WORLD.



First, Windows 95 doesn't have any virus prevention or protection built in.

And on the networked, file-sharing superhighway of life, the chances that your PC will be exposed to a virus are far greater than you might think.

And guess what? Your old anti-virus software won't work in the brave new world of Windows 95. But thousands of old viruses will.

Which is why you should install Norton AntiVirus® for Windows 95 from day one.

Norton AntiVirus is verified to protect you from 100% of all viruses known to be in circulation.*

Norton AntiVirus for Windows 95 protects you from virus attacks.

But you need more than just protection from a long list of known viruses. Which is all that ordinary anti-virus packages can offer.

Norton AntiVirus also offers you the most complete protection from unknown viruses. Thanks to our unique virus detection technology, Norton AntiVirus spots virus activity in your system and eradicates it before it can do any serious damage.

So even if you encounter a virus that was just created yesterday by some hacker with a bad frozen pizza habit, Norton AntiVirus will find it and stop it.

And when could you possibly need protection from unknown viruses more than in a brand-new operating system?

A 32-BIT OPERATING SYSTEM DEMANDS 32-BIT PROTECTION.

Another thing you may not know is that your old 16-bit utilities won't work in Windows 95.

Work faster and more productively with Norton Navigator for Windows 95.

And the utilities included in Windows 95 itself won't give you much protection in a 32-bit world.

Only native 32-bit utilities can give you adequate system protection in a 32-bit environment.

Which is why you need to upgrade your utilities to Norton Utilities® for Windows 95.

The first thing Norton Utilities will do for you is optimize your system for Windows 95 with a Pre-installation Tune-up.

Then Norton Utilities runs continuously in the background, monitoring your system and automatically launching the right tools to maintain system performance and prevent system crashes.

*Verified in independent tests conducted by NCSA and VSUM, July 1995. **Trade-up editions will run only when specified Symantec, Central Point, McAf Norton AntiVirus and Norton Utilities are registered trademarks and Norton Navigator is a trademark of Symantec Corporation. All other brand names or trade In Australia, call 2-879-6577. In Europe, call 31-71-353111.*

And if something does go wrong, Norton Utilities gives you the data recovery tools users have relied on from day one.

So from the day you install Windows 95, your system is stable and your files are protected.

Norton Utilities keeps your data safe from harm.

THE MORE WORK YOU DO, THE MORE WORK NORTON NAVIGATOR WILL DO FOR YOU.

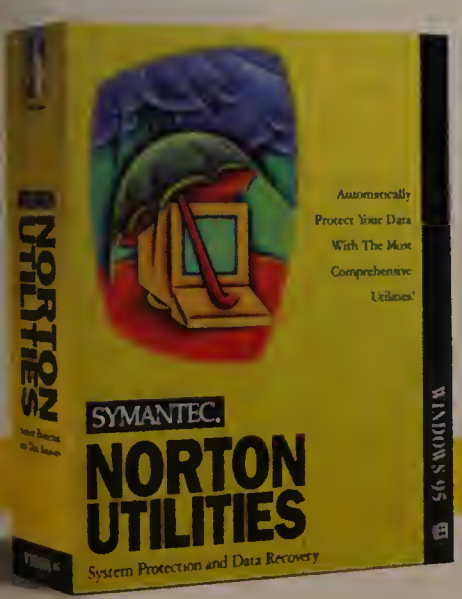
Windows 95 has lots of terrific features to make life easier. Like Plug 'N Play. And long file names.

AND PRODUCTIVITY FOR FROM DAY ONE.

But what about getting even more out of Windows 95? Like getting more done in less time.

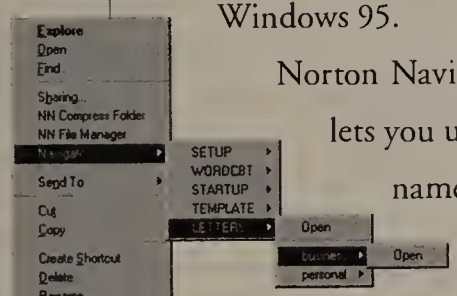
With Norton Navigator, you can navigate through your desktop five times faster than in Windows 95. Be more productive with multiple project-oriented desktops. Open the files you need most in a single click.

And that's just the first minute.



You can plug into your Internet connection right from the Norton File Manager. Search for text strings within files at least ten times faster. (In fact, the more files you have and the bigger they are, the more time you'll save.)

And copy a file anywhere on your hard drive or on the network with just one click. Instead of click click click click click click click click (are you tired of clicking?) click click click. Which is generally how long it takes to copy a file in Windows 95.



Norton Folder Navigator extends your menu power.

Norton Navigator also lets you use long file names for most 16-bit applications. And gives you loads of other time-saving tools like built-in PK-Zip compatible file compression and the ability to delete, move, zip or encrypt from any Open or Save dialog box.

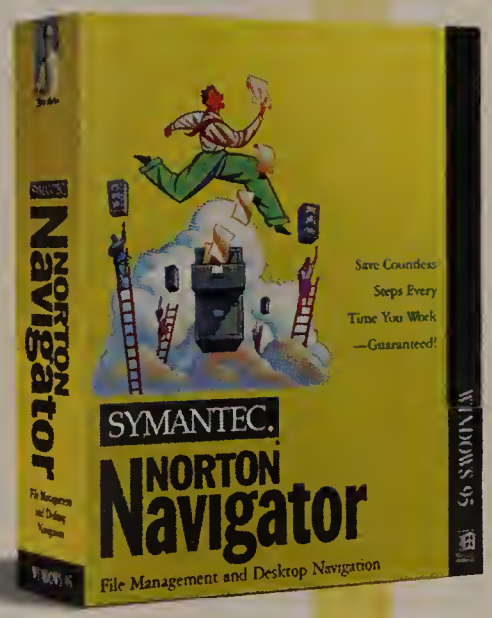
So why waste time wading up and down menus, clicking your life away? Every minute counts.

SYMANTEC.®

WINDOWS 95 IS A GREAT PLACE TO BE. WE GUARANTEE IT CAN BE EVEN BETTER.

Like all Symantec products, Norton AntiVirus, Norton Utilities and Norton Navigator come with a 60-day money-back guarantee. And we'll even make it easy for you to trade up from your current 16-bit Symantec and Central Point products.

So on the day you load Windows 95, make sure you're ready. With the new Norton AntiVirus, Norton Utilities and Norton Navigator from Symantec.



GET YOUR TRADE-UP EDITION TODAY.

Norton AntiVirus for Windows, PC Tools, Norton Desktop for Windows, Central Point Anti-Virus, McAfee VirusScan and Dr. Solomon's Anti-Virus owners trade up to Norton AntiVirus for Windows 95 for ***$29.95.****

Norton Utilities, Norton Desktop for Windows, and PC Tools owners trade up to Norton Utilities for Windows 95 for ***$59.95.****

Norton Desktop, PC Tools, XTree and Norton Commander owners trade up to Norton Navigator for Windows 95 for ***$39.95.****

To purchase, visit your software store or call us at 1-800-450-9760 ext. 9238.

FROM DAY ONE NORTON FOR WINDOWS 95

Circle 167 on reader service card

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Ink Jet Innovator Offers Better Color, Higher Resolution, New Media

Canon, longtime innovator with its Bubble Jet technology, is launching a new wave of ink jet products that includes software and special print media as well as printers.

The BJC-4100 ink jet printer, street priced at $359, features 720-by-360-dpi black or color resolution—many similarly priced products offer only 300 by 300. It's rated to print color at 0.8 pages per minute and monochrome at 5—typical ink jet speeds. For those with more cash, the $559 (street price) BJC-610 replaces the BJC-600e, which won a Best Buy in our top ten printers review in August. The BJC-610 adds true 720 by 720 resolution, crisper than the BJC-600e's interpolated resolution. The BJC-610 is rated to print monochrome faster than the BJC-600e: 3 ppm as opposed to the 600e's 2.5 ppm. Both devices are rated to print color at 1 ppm. The new units hold 100 sheets of paper and offer a small footprint—just over 1 square foot.

The new printers include a bundled CD-ROM containing third-party programs that assist in page design with prebuilt, easily customizable templates. While not intended to replace mainstream page layout programs, the various software titles are aimed at novices. There's also a selection of 50 Hallmark greeting card designs.

Canon now offers several print media for your ink jet. In addition to a line of coated and glossy papers, you can choose from a selection of iron-on fabric transfers so you can, say, put your company logo on T-shirts.

—Bill Underwood

TOP OF ITS CLASS: The BJC-4100 is one of the only products in its class to offer 720-by-360-dpi black or color resolution.

Canon BJC-4100, BJC-610

Great color quality, higher resolutions than some lasers, and new print media options.

Canon Computer Systems
800/848-4123, 714/438-3000
Street price: BJC-4100 $359, BJC-610 $559; 200-sheet pack of letter-size paper $29; 10-sheet pack of T-shirt transfers $17.95
Reader service no. 613

New IBM Monitors Know Plug and Play

IBM's new P Series monitors are high-end displays designed to exploit Plug and Play's benefits. They can communicate with Windows 95 using VESA's Display Data Channel (DDC) standard. This lets the operating system automatically configure the monitor to work at its optimal settings. All you do is connect a DDC-compliant graphics card, and you never have to worry about setting refresh rates again.

The VESA committee is talking about raising the bar for flicker-free refresh rates from 75 Hz to 85 Hz, and IBM is already ahead of the game. The 15-inch IBM P50 and the 20-inch IBM P201 support flicker-free noninterlaced operation at up to 85 Hz. The 17-inch IBM P70 and 20-inch IBM P200 can run at up to 75 Hz.

The P Series monitors use Sony Trinitron tubes, which provide crisp, clear images using colored vertical stripes rather than an array of dots. Three of the four models have a .26mm stripe pitch, roughly equivalent to a .28mm dot pitch, and all four feature on-screen digital controls for manipulating brightness, positioning, and more. All screens also have antireflective treatments.

Screen real estate is impressive. The 20-inch P200 and P201 monitors have 19.1-inch viewable screens, while the 15-inch P50 and 17-inch P70 have viewable screens of 13.6 and 15.9 inches, respectively.

Besides being easy on the eyes, these monitors are easy on the environment. Each supports VESA's Display Power Management Software spec and meets the Environmental Protection Agency's Energy Star standards by consuming less than 8 watts when not in use. In addition, the P Series qualifies for the European Nutek seal of approval by lowering emissions to below MRP-II guidelines—the P70, P200, and P201 even meet the ultrastringent TCO-92 standards.

Prices for the P Series monitors are high but are comparable to those for Trinitron units from vendors such as Nanao, Nokia, and Sony. And it's tough to beat IBM's reputation for quality and service.

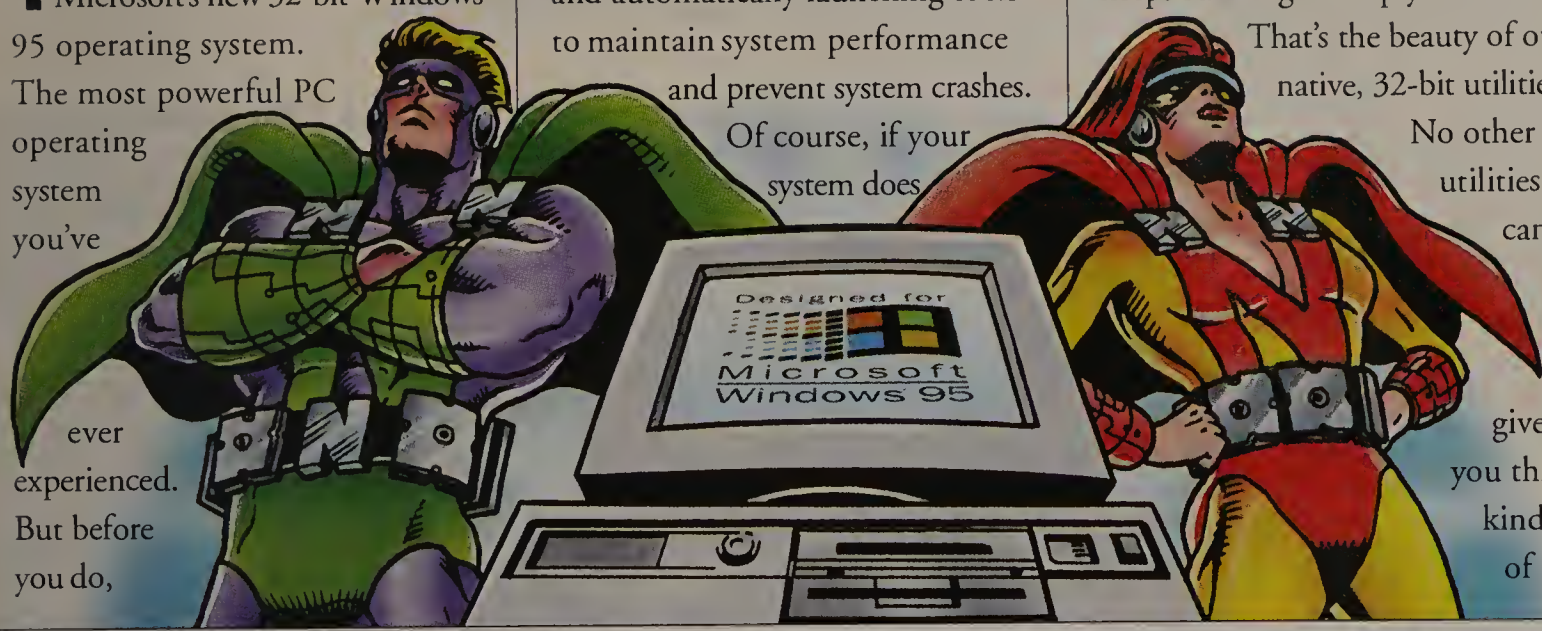
—Brad Grimes

IBM P Series monitors

Four new Trinitron monitors that comply with Windows 95 Plug and Play guidelines and meet strict environmental standards.

IBM Personal Computer Co.
800/426-2968
List price: $654 to $2874

You're ready to make the move to Microsoft's new 32-bit Windows 95 operating system. The most powerful PC operating system you've ever experienced. But before you do, upgrade your utilities to Norton Utilities® for Windows 95.



NORTON UTILITIES PROVIDES THE ONLY AUTOMATIC DATA RECOVERY AND CONTINUOUS SYSTEM PROTECTION FOR WINDOWS 95.

IT'S A 32-BIT WORLD OUT THERE.

You already know Norton Utilities is the best set of tools for system protection, hard disk optimization and data recovery.

What you may not realize is that your current 16-bit utilities won't run under Windows 95.

And the simple utilities found in Windows 95 itself don't offer sufficient data protection for life in a 32-bit world.

Which is why you need the new Norton Utilities for Windows 95.

The first thing Norton Utilities for Windows 95 will do for you is tune up your system for Windows 95 by optimizing your hard drive and cleaning out all of the files you no longer need.

Then Norton Utilities runs in the background, monitoring your system and automatically launching tools to maintain system performance and prevent system crashes.

Of course, if your system does crash or you accidentally erase a file, Norton Utilities for Windows 95 gives you the data recovery tools users have relied on from day one.

Even if other applications crash, Norton Utilities for Windows 95 keeps running to help you recover.

That's the beauty of our native, 32-bit utilities. No other utilities can give you this kind of continuous, real-time protection and data recovery in the brave new world of Windows 95.

NORTON UTILITIES FOR WINDOWS 95

PRE-INSTALLATION TUNE-UP
Frees up disk space and provides a comprehensive pre-installation physical.

NORTON SYSTEM DOCTOR
Continuously monitors all vital resources and data integrity. Alerts you to impending disaster and recommends action or fixes problems automatically.

NORTON DISK DOCTOR®
Automatically diagnoses and repairs file system problems using the speed and safety of 32-bit technology.

UNERASE®
100% protection of erased files. The new wizard-like interface leads you through file recovery step by step.

SYSTEM INFORMATION
Diagnoses potential conflicts and configuration problems with detailed system information and performance testing.

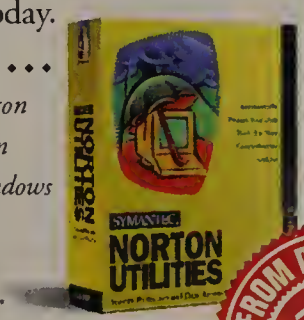
NORTON SPEED DISK™
Automatically optimizes drives and reduces future fragmentation using 32-bit technology.

PROTECT YOUR DATA FROM DAY ONE.

And like every software product from Symantec, Norton Utilities for Windows 95 comes with a full sixty-day money-back guarantee.

So you've got nothing to lose. Except your data. Get your trade-up edition of Norton Utilities for Windows 95 today.

If you own Norton Utilities, Norton Desktop for Windows or PC Tools, get your $59.95 trade-up edition of Norton Utilities for Windows 95 today. To purchase, visit your software store or call us at 1-800-450-9760, ext. 9239.*



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Graphics for Executives: Drag'n Draw and FlowModel

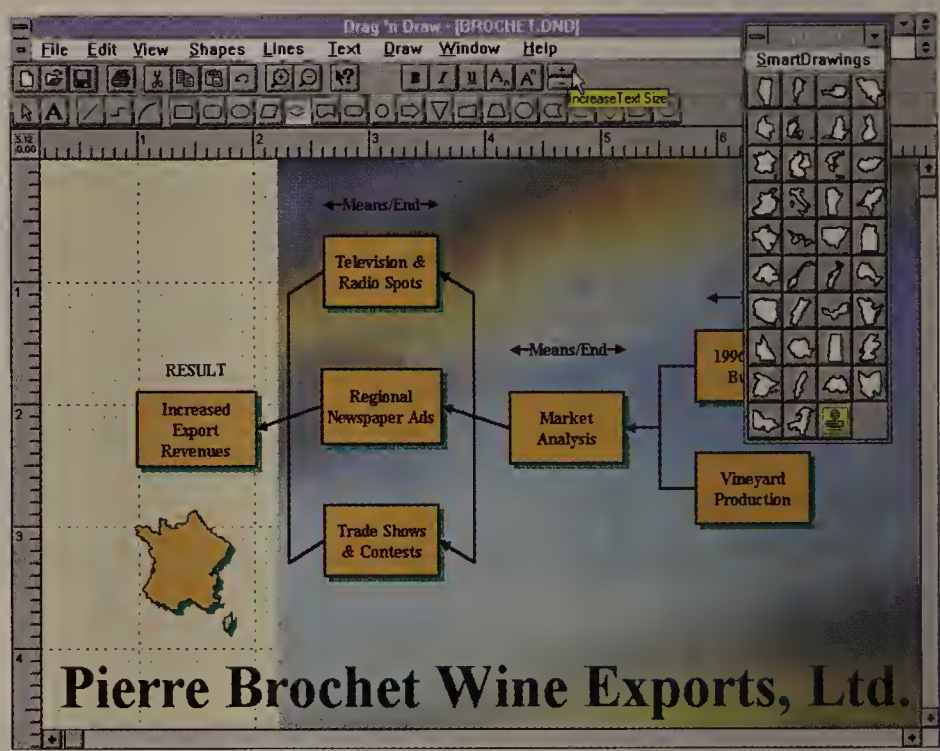
Sometimes, when you can't find just the right words to get an important point across, you need a good graphic. Chances are, your presentation package won't have an appropriate clip art image, and you don't have the time to learn a full-fledged graphics program. Drag'n Draw 1.0 offers quick and hassle-free ways to create easy-to-understand graphics. And when you need more than a simple diagram, FlowModel 2.0 makes it easy to draw a complex flowchart, as well as organize and analyze data related to the chart. Both of these applications integrate smoothly with regular business applications and sport extensive arrays of templates and symbols.

DeltaPoint Drag'n Draw 1.0

Simplicity is the idea with DeltaPoint's 16-bit Drag'n Draw. It has over 40 Shape Libraries containing more than 1000 pieces of clip art that you can drag and drop into your graphic images and then customize. Each shape resizes automatically when you type, both proportionally and in whatever direction you choose. You can link objects to one another, align them, and drag them into other Windows applications using OLE 2.0.

Drag'n Draw's wizards and templates help you create several types of figures, including flowcharts, network diagrams, org charts, time lines, quality control diagrams, floor plans, and technical drawings. Simply select one of the more than 35 templates, pick the shapes you want, position them into your graphic, and you're finished.

If you change your mind, Drag'n Draw lets you select alternative symbols and substitute them in your graphic automatically. The program can create diagrams as large as 50 by 50 feet, organize them in hierarchical order, and link them to subdiagrams of your main chart. A 32-bit Windows 95 version of Drag'n Draw should be available by the end of 1995.



DRAG'N DRAW'S INTUITIVE INTERFACE, context-sensitive description bubbles, and shortcuts let infrequent users create business graphics easily.

Arcland FlowModel 2.0

If you construct complex flowcharts, an elementary drawing program could leave you running in circles. Many people use flowcharts not only to communicate an idea or a business process, but also to analyze information. This is where FlowModel 2.0 offers special advantages. The 32-bit application runs under Windows 95, Windows 3.1, and Windows NT.

Constructing the flowcharts is simple: FlowModel lets you point and click to place shapes on a grid and connect them. Create your own symbols if you like, by importing any bit map or Windows metafile image. You'll also find plenty of premade flowchart templates, and you can create your own templates for use in a workgroup. This is where most drawing packages stop in terms of functionality, but FlowModel stands out for two reasons.

First, it provides unique automation features that make it easy to organize and reorganize your flowcharts. For example, you can enter all the items you want to diagram, choose the Layout All command, and the software will display the best graphical representation.

Second, FlowModel lets you attach data to objects in the chart. For each symbol in a flowchart (and connectors between symbols), you may attach a data table of any size. For example, you might enter data tables regarding costs or inventory levels. You can also import and export the data as ASCII text files. When you import new information, FlowModel automatically updates your flowchart, and the program helps you easily manipulate and analyze relationships between data in your chart. For this reason, many people use FlowModel for business-process reengineering projects.

Because FlowModel is compatible with Microsoft Office 95, it offers basic integration with Microsoft's application suite, including a similar look and feel and support for long file names. (It doesn't integrate with Office's Binders, though). Still, the newest version of Arcland's sophisticated flowcharting package has a lot to offer.

—John Goddard and Laurianne McLaughlin

Drag'n Draw 1.0

Low-cost drawing and diagramming for nonartists.
DeltaPoint
800/446-6955
Street price: $79
Reader service no. 840

FlowModel 2.0

This 32-bit application simplifies drawing flowcharts and analyzes related data.
Arcland Inc.
800/276-9993, 610/993-9904
List price: $195
Reader service no. 841

Windows 95 is here. And it's really terrific.

Except for one thing: it doesn't include any anti-virus protection. And your old anti-virus software won't work in Windows 95 either. But thousands of old viruses will.

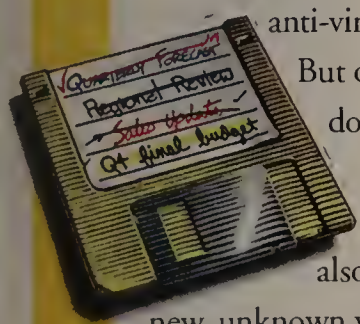
So that leaves you with a choice. Do nothing and hope you never come across an infected floppy or download an infected file. Or buy a new anti-virus software product that can work in this new environment.

But which anti-virus product should you buy? Norton AntiVirus® for Windows 95.

DETECTION, PREVENTION, DESTRUCTION. IF YOUR ANTI-VIRUS SOFTWARE DOESN'T HAVE ALL THREE, YOU'LL BE COMPLETELY EXPOSED TO VIRUSES IN WINDOWS 95.

NCSA CERTIFIED SO YOU CAN REST EASY.

Norton AntiVirus for Windows 95 is NCSA certified to detect 100% of the viruses found in circulation. And recent independent tests* conclusively demonstrate that Norton AntiVirus for Windows 95 detects and destroys as many or more known viruses as any other anti-virus product around.



But our virus protection doesn't stop there. Norton AntiVirus for Windows 95 also protects you from new, unknown viruses. Thanks to a unique virus detection technology that allows us to spot any suspicious activity, no matter where it's lurking.

So your system is safe. Not just protection without a host of long annoying disruptions to your work.

Because Norton AntiVirus for Windows 95 scans files fast. Even compressed files.

And Norton AntiVirus works in the background, continuously monitoring file access and usage. So it can stop viruses in their tracks. Which means you don't have to worry every time you put a floppy in your disk drive.

Designed for Microsoft® Windows® 95

NORTON ANTIVIRUS FOR WINDOWS 95

WINDOWS 95 COMPLIANT
Full 32-bit application. Supports long file names and Universal Naming Conventions.

AUTOMATIC BACKGROUND MONITORING
Virtual device driver unobtrusively checks for viruses in the background. Ensures backups and files transferred are virus-free.

FAST SCANNING
Provides ironclad virus protection without affecting productivity. Scans even compressed files fast.

EXCLUSIVE VIRUS SENSOR
Provides continuous, transparent protection against new, unknown viruses.

NCSA CERTIFIED
Detects 100% of viruses found in circulation.

THE NO RISK ANTI-VIRUS SOLUTION.

Needless to say, Norton AntiVirus for Windows 95 comes with our standard sixty-day money-back guarantee.

So why gamble on running Windows 95 without complete virus protection? Get your trade-up edition of Norton AntiVirus for Windows 95 today.

TRADE-UP EDITION NOW ON SALE.

*If you own Norton AntiVirus, Central Point Anti-Virus, Norton Desktop for Windows, or PC Tools, get your $29.95 trade-up edition** of Norton AntiVirus for Windows 95 today. McAfee VirusScan and Dr. Solomon's Anti-Virus owners also eligible. To purchase, visit your software store or call us at 1-800-450-9760 ext. 9241.*

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*Independent tests conducted by NCSA and VSUM, July 1995. **Trade-up editions will run only when specified Symantec, Central Point, McAfee or Dr. Solomon's products are already installed. Check with your software store for qualifying versions. Price does not include shipping & handling or any applicable sales tax. Symantec and Norton AntiVirus are registered trademarks of Symantec Corporation. All other brand names or trademarks are the property of their respective owners. ©1995 Symantec Corporation. All rights reserved. Visit us on the Internet at http://www.symantec.com. In Canada, call 1-800-365-8641. In Australia, call 2-879-6577. In Europe, call 31-71-353111.

AskSam and ZyIndex Manage Information Overload

The latest incarnations of two venerable Windows 3.1 programs can tame information overload: askSam and ZyIndex, Windows 3.1 apps that should run under Windows 95, take very different approaches to data management surfers.

AskSam has been around for years. While products like Access or dBASE force you into a structured way of handling data, askSam shines at managing unstructured information—you can, for example, dump months of E-mail or Internet newsgroup discussions into an askSam database. The latest version also imports HTML (hypertext markup language) documents, perfect for dedicated Web surfers.

After you've fed askSam the data, you can use phrases or Boolean searches to quickly find the exact information you need. Version 3.0 of the program adds "fuzzy" searching capability: If, for example, you don't know exactly how *Miastkowski* is spelled, a reasonable guess will do.

Although it's well-designed, askSam 3.0 requires some work on your part. It won't search the nooks and crannies of your computer for files; you have to specify which files to import. It's great for keeping random notes, however—in many ways better than a PIM. And for structured data, you can create fields and forms, just as you can with askSam's competitors.

ZyIndex is a text indexing application, which means it goes out and indexes your files (as opposed to askSam, which requires you to import files and data into the program). Version 5.2 comes with two modules: ZyBuild and ZyFind. ZyBuild creates a word-for-word index of your data files—either specified groups or all your files.

Initially, indexing is slow. ZyBuild took 30 minutes to index a directory with 14MB of data; indexing an entire disk can take a whole weekend. Also, your indexes must be updated regularly, which ZyBuild can do automatically in the background at times you specify.

ZyFind makes up for all the time required to build the index. Enter a word or a Boolean expression and within seconds you'll see a list of "hits," files you can view, print, or launch in their related applications. ZyFind also lets you use optional fuzzy searches.

At $395, ZyIndex isn't cheap. But if handling large amounts of information is essential to your work, the program pays for itself. The downside is that the frequently esoteric user interface needs work, especially in the ZyBuild module.

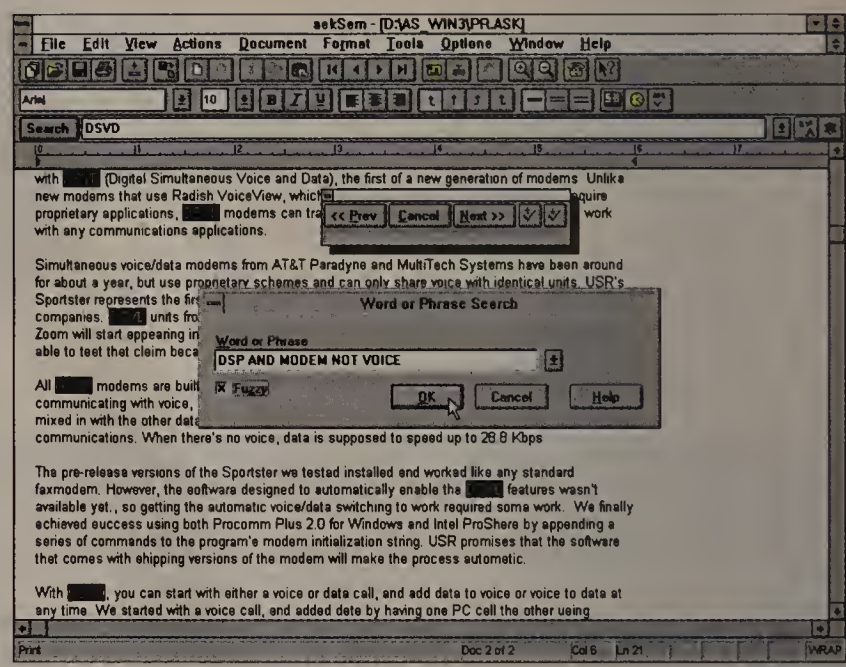
—Stan Miastkowski

askSam 3.0 for Windows

The ultimate free-form database gets better.
askSam Systems
800/800-1997
List price: $149.95
Reader service no. 842

ZyIndex 5.2 for Windows

Quirky but powerful full-text retrieval system.
ZyLab
800/544-6339
List price: $395
Reader service no. 843



"FUZZY" SEARCH: AskSam lets you search your database for words and phrases—even if you don't know the right spelling.

HiJaak 95 Tracks Graphics Files

Hunting down graphics files with Windows 95's Explorer can get confusing. Most image files are assigned a generic Microsoft icon. Inset's HiJaak 95, a Win 95 program that includes its previous version's file translation and graphics utilities, replaces the generic icons with thumbnails that show what each graphic looks like. If files move or change appearance, HiJaak 95 keeps track of and updates each thumbnail in the background.

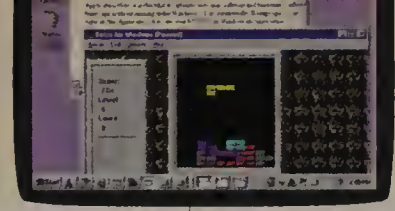
HiJaak 95 works seamlessly: There is no start-up screen when you launch it, and the program can automatically convert files to common formats used by other programs. With its integrated tools, you can use sophisticated search methods and convert to a vast array of file formats from within other Windows 95 applications.

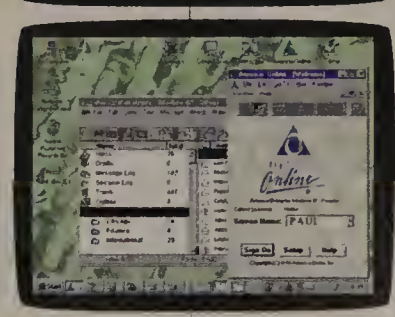
The product supports most Windows 95 standards, including OLE 2.0, multitasking, and 32-bit File Access. You can use long file names and search for images either visually or by assigned keywords, color, location, file size, or date. To launch a graphic, you simply double-click it. HiJaak 95's Smuggler module is also handy; it lets you import more than 75 graphics formats. HiJaak 95 can convert up to 35 types of raster (bit-map) and 20 vector (draw) formats individually or in batches.

—John Goddard

HiJaak 95

Integrated graphics management for Windows 95.
Inset
800/374-6738
Street price: $49
Reader service no. 844





The Top 10 Reasons Why Norton Navigator Users Work Faster In Windows 95.

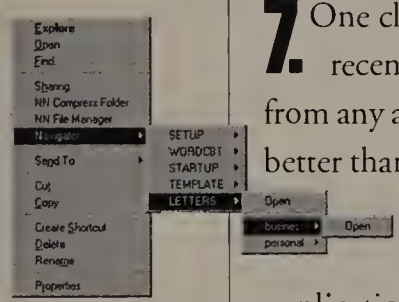
Congratulations! You're the proud owner of Microsoft's Windows 95 operating system. Working on a PC has never been easier.

Now try these ten easy exercises and see how you can work even better and faster in Windows 95 with the all-new Norton Navigator.™

~~CLICK.~~ ~~CLICK.~~ ~~CLICK.~~ CLICK.

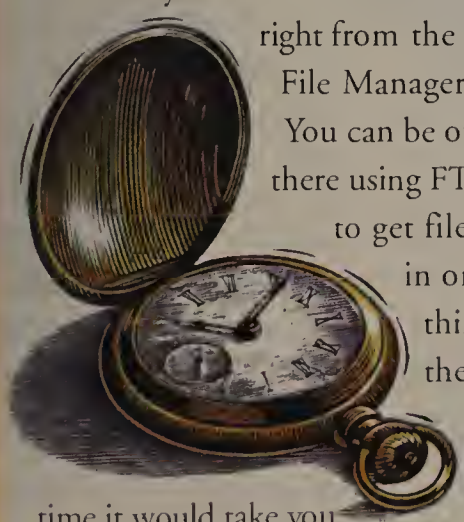
1. First, copy a file from one directory to another. Okay, now copy another file. On average, it takes about eleven steps per file. Now copy a file with Norton Navigator. Mission accomplished. One step.

2. Opening a folder in Windows 95 takes a full five clicks of your trusty mouse. But with Norton Navigator, you can open any folder with just one simple click.



3. Compress a file. Our built-in PK-Zip compatible compression saves you a minute every time.

4. Use Norton Navigator to plug into your Internet connection right from the File Manager. You can be out there using FTP to get files in one third the time it would take you with a separate application.



5. Try a word search for "profits" or any other text string within files. It's at least ten times faster on average with Norton Navigator. No matter how many files you have. Or how big they are. In fact, the bigger the files, the more time you'll save.

6. Save another minute every time you delete, move, zip, or encrypt from any application's Open or Save dialog box. (Are you keeping count?)

7. One click is all it takes to access recently opened files or folders from any application. Now isn't that better than wading through folders?

8. Launch your favorite files, folders, or applications simply by pushing a button on the Norton Taskbar. No more going up and down to and from the Start menu over and over again.

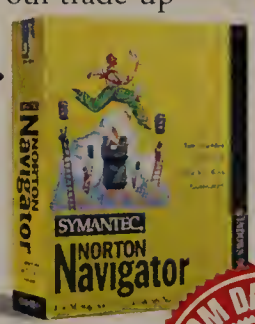
9. With Norton Navigator, you can create a different desktop for each project. So you can find your work more easily. And save even more time.

10. Windows 95 supports long file names for all of your new 32-bit applications. Norton Navigator supports long file names for most 16-bit applications, too. So you'll never again have to remember what "billgbox" means.

Make Windows 95 An Even Better Place To Be.

Well, there you have it. Our Top Ten. But try Norton Navigator for yourself and we're sure you'll find your own favorites. Because one of the greatest things about Norton Navigator is it lets you work the way you want to work. Needless to say, it comes with our standard 60-day money-back guarantee. So get your trade-up edition today.

If you own Norton Desktop, PC Tools, XTree, or Norton Commander, get your $39.95 trade-up edition of Norton Navigator for Windows 95 today. To purchase, visit your software store or call us at 1-800-450-9760 ext. 9242.*



FROM DAY ONE 1 NORTON FOR WINDOWS 95

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Norton Navigator For Windows 95

Norton Navigator Accelerates Your File Management In Windows 95.

Norton Navigator puts file management at your fingertips with Norton File Manager, Explorer Extension and FileAssist.

Norton Folder Navigator lets you open, copy, move or create a shortcut for any folder with just one mouse click.

Norton Taskbar features multiple desktops that let you organize your files and find your work faster.

Norton FastFind performs specific text string searches at least ten times faster than Windows 95.

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An Easy Way to Organize the Windows 95 Desktop

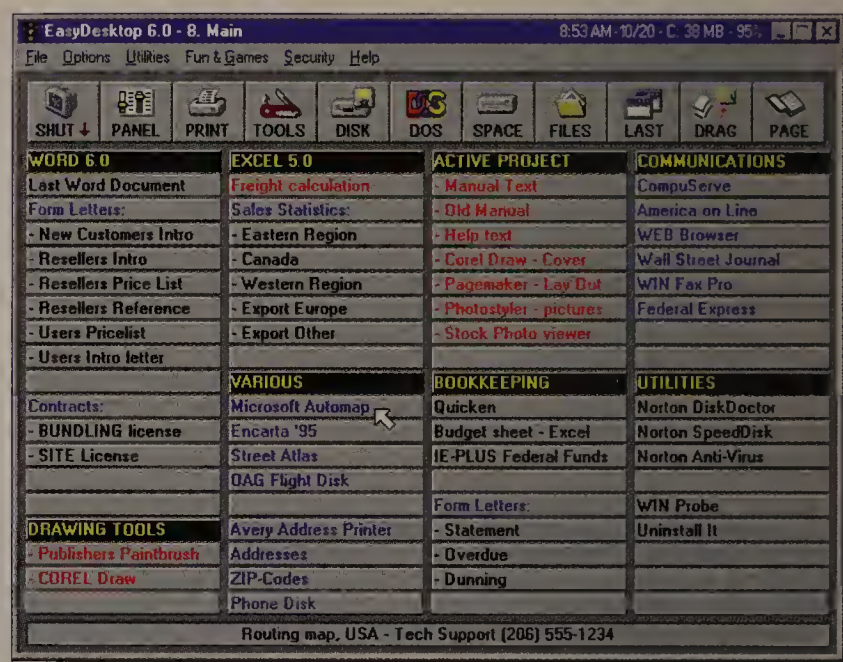
Hierarchical menus and icon glut can be a drag. Even in Windows 95, you have to either dig into menus or sift through desktop icons to find your applications and files.

MicroSeconds' EasyDesktop 6.0 program launcher and utility package brings relief. It uses the same menulike metaphor that its well-received predecessor, EasyDesktop 5.0, brought to Windows 3.1. Now, instead of wasting time rooting through Windows 95's Start Menu or picking among a mess of desktop icons, EasyDesktop lets you choose programs and files from buttons on a single desktop.

Click a button on the menu, and EasyDesktop launches the corresponding program or file. According to the vendor, you can drag any icon in Windows 95 to any location on any menu page to make a button of that icon. The program allows you to organize the buttons on up to ten pages of 76 buttons per page, with each page divided into four columns. Right-click a button and you'll get a drop-down menu of relevant commands to change that button's properties or to view or print the button's item.

Whichever page you're on, a button bar remains at the top of the page, ready with 11 larger tool buttons. Among these are the Shut button to shut down Windows 95, the Panel button for instant access to the Windows 95 Control Panel, the Disk button for quick access to disk copy and format functions, the Files button for access to MicroSeconds' EasyFile file manager, the Last button for a list of the last 15 menu-page buttons you've used, and the Tools button for quick access to EasyDesktop's tools and utilities.

—Shane Rau



NO MORE ICONS: EasyDesktop replaces your Windows 95 hierarchy of icons and menus with a page of labeled buttons.

EasyDesktop 6.0

Program launcher and utilities package for Windows 95.
MicroSeconds Int'l
800/889-3279, 619/756-0765
List price: $59.95
Reader service no. 845

Business Cards for Less

Whether you're just starting out on a new business venture or looking for ways to cut costs in your office, Easy Business Cards from Claris can help you create professional-looking business cards in a snap—and for a fraction of what you'd pay at a print shop.

Although you can find similar products on the market, none match Easy Business Cards' breadth of sample layouts and customization tools. In addition, Claris has teamed up with PaperDirect, one of the largest suppliers of specialty papers in the U.S., to provide a complete solution: You get more than 290 templates designed specifically for use with paper stock from PaperDirect and enough paper to print 250 business cards. You're not limited to using PaperDirect stock, either; the software will work with any perforated business card stock.

Easy Business Cards provides a wealth of tools to ensure a creditable design job. To create a business card, you can select a predesigned layout or create your own from scratch. Choose the paper stock you want to use, the category or design of the card, and its orientation (horizontal or vertical); a listing of sample card layouts is then displayed in the Card Gallery. Double-click a card to select it, and enter the main editing window for customization. Then simply select each object on the card and replace it with your own information.

To add clip art to a card, select an object from the 45 or so images that ship with Easy Business Cards, or import your own image from any common graphics file format. You can also use the full set of drawing tools to create custom clip art.

To create business cards for a group of people, use the Address Book to store each individual's name and address, and then create links back to the card layout. To create each person's card, switch to the appropriate name in the address book, then output the card to a printer or, for the highest quality, send camera-ready art to a printing house.

Easy Business Cards supports Windows 3.*x* and higher and is compatible with Windows 95.

—Catherine Kenny

Easy Business Cards

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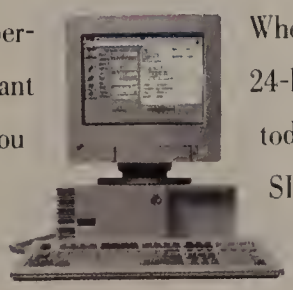

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Here's Easier Access to Your Corporate Data

Though reporting tools can make it easy to gather and view information from company databases, the features can be tricky to use—and can tie up your LAN if someone orders reports containing multiple megabytes of data. The latest Windows 3.1 versions of two popular network products address these problems.

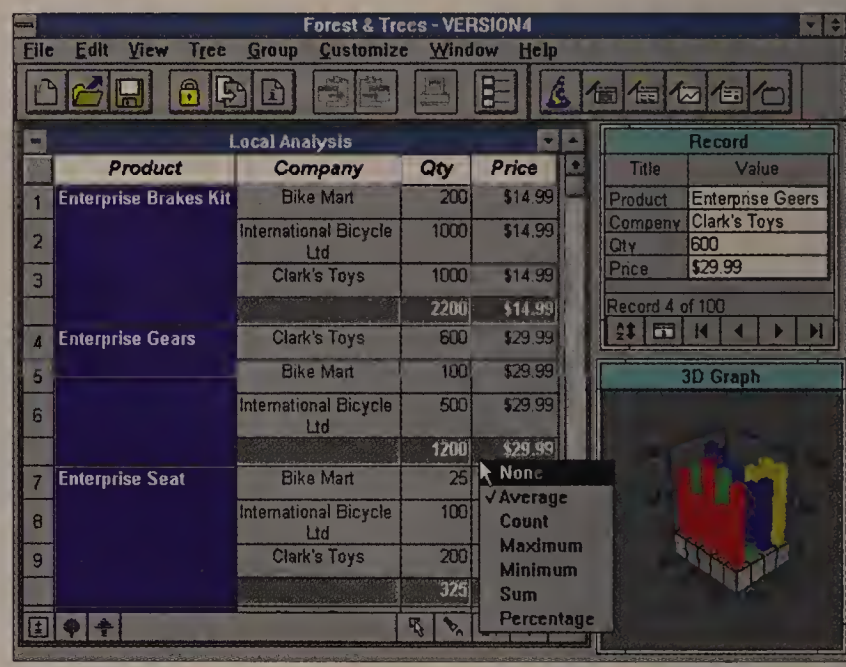
Crystal Info, a package that includes Crystal Reports 4.0, offers tools for managing network traffic. It lets you schedule long reports after hours. Additionally, your LAN administrator can specify who has access to particular reports or databases, when reports can be processed, and how long each report can be.

I found the user and administrator menus in the prerelease version intuitive. The final product will add the ability to manage reports—not just from Crystal Info but from any other reporting package.

Platinum Technology's Forest & Trees is easier to use. With version 4.0, you no longer need to know SQL or preprogram reports. The new package adds graphical menus that let you build your own reports.

Forest & Trees maintains its major advantage over simpler, less expensive products like Crystal Info: Programmability. Your developers can customize report menus or add features that automatically print or E-mail specific reports under certain conditions.

—Tony Baer



FOREST & TREES 4.0 has added graphics and pop-up menus that simplify creating reports and analyzing data.

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RAM Managers: Best Bundle or Best Bargain

Though Windows 95 is supposed to reduce crashes and memory problems, many of us are still stuck with Windows 3.1 and its inherent problems. Using one of a slew of Windows 3.1 memory managers can make life bearable until the inevitable upgrade.

Helix Software's Hurricane 1.0 and AnswerSoft's MemPlus 2.0 are two recent products.

Hurricane is among the most comprehensive products we've seen, and it provides the best performance. From the developer of Netroom, the well-regarded DOS memory manager, Hurricane is a collection of 11 utilities that gather information about and optimize your system. Included are sophisticated disk and print caches and a screen accelerator that speeds up nonaccelerated VGA and super-VGA video cards.

But the real news is Hurricane's tools for overcoming the memory limitations of Windows 3.1. One utility enlarges your system resources—memory that Windows uses to track windows, dialog boxes, icons, and buttons. When you run out of memory in Windows, it's often because you're running out of system resources.

Another utility moves icons and DLLs out of lower memory; this also helps prevent 'Out of Memory' error messages.

Though it's the least expensive of the RAM managers we've reviewed, MemPlus is a one-trick pony. It deals strictly with overcoming Windows 3.1's memory limitations, and it does so by working just with the 640K of lower memory.

MemPlus frees up lower memory by loading Windows device drivers into extended memory and managing lower memory better than Windows can. It works, but not quite as effectively as Hurricane or similar products we've tested.

—Reid Goldsborough

Hurricane 1.0

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MemPlus 2.0

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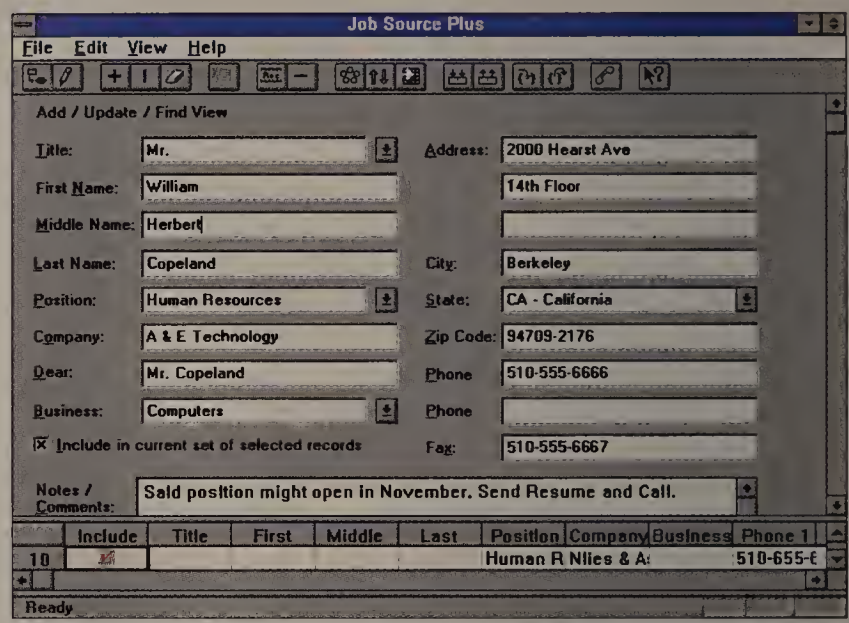

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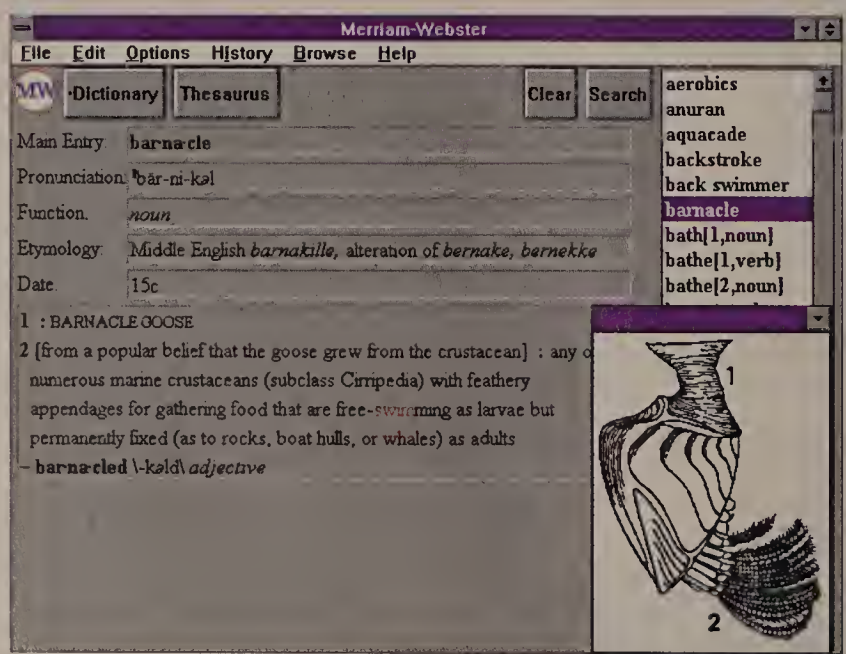

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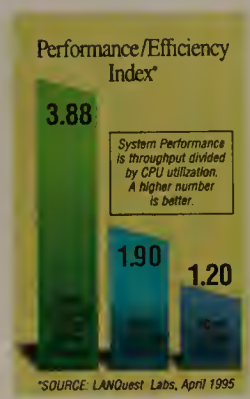

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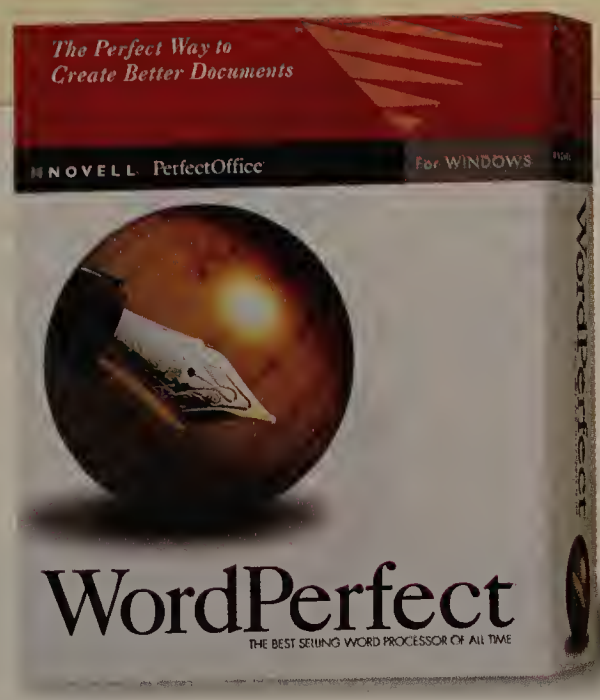

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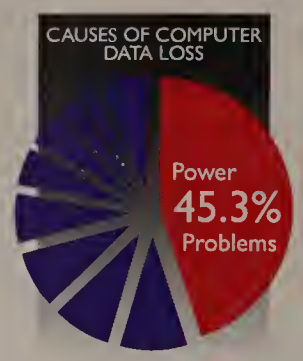

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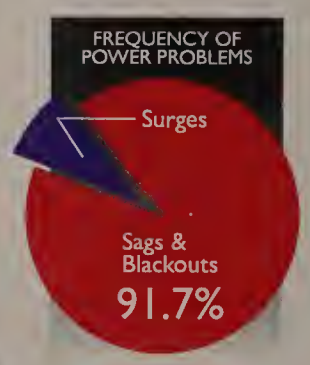

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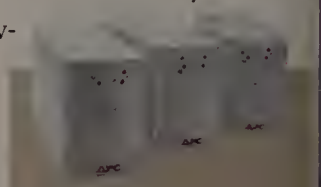

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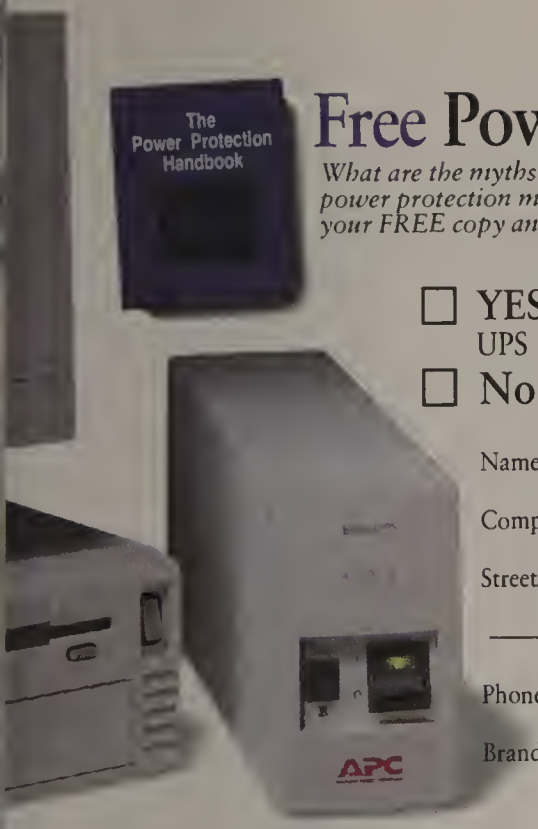

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Brands of UPS used? _____ # servers/PCs to be protected? _____

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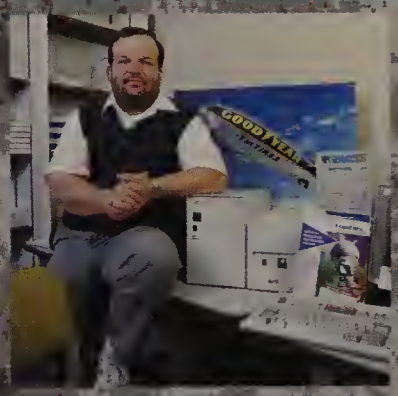
rotection against
nd other trials by fire

More than 3,000,000 satisfied customers count on APC reliability that goes above and beyond the call of duty

After a raging fire which took 18 trucks to subdue, Michael Benolkin, director of the Systems Division at Correa Enterprises, Inc. didn't expect much. "While rummaging through the ashes, we heard something beeping. Our four APC units were still in action, while two UPSes from another brand were history. We're still using these same APC units at our new office location - they still work like a charm! We're impressed with the ruggedness, reliability, and product support offered by APC."

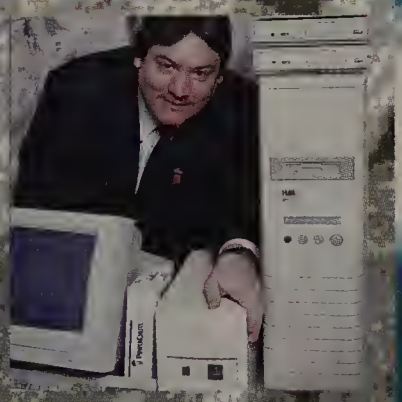
Trial by Fire

Brian Krause, Network Manager for Goodyear Airship Operations, knows how critical APC protection can be." The night of the All-star game a tornado came through our blimp hanger and took out our roof. Our airships demand absolute communication so I protect our local and remote servers with the most reliable protection I can find: APC. APC's PowerChute software shut our server down in an orderly way... closed out all files nice and neatly. When we reconnected, everything came back up perfectly, without a hitch."



Trial by Air

Doug Welch learns his reliability lessons well: "While still a Computer Science student, I was at home preparing a large spreadsheet for a final project when Anchorage experienced an all too common 5+ Richter earthquake. If not for my Back-UPS 400 it would have been back to square one! I'm now the Network Systems Manager at Charter College, in charge of three networks. I learned my UPS lesson well back in my student days. I've never been disappointed with APC and the product has had quite a work out."



Trial by Earth

Faced with a water main break, Mark Conley, Regional Manager of Novell's remote sales office in Detroit was amazed at APC's reliability. "The APC unit was sitting in an inch and a half of water, working just fine, as though nothing was unusual and we lost no data to this disaster. We've used APC here now for at least four years - more than a dozen units are all around the office, and we're well satisfied, so we were even more impressed to learn that the units are amphibious!"

Trial by Water

Back-UPS Award Winning FEATURES

- Unmatched surge/lightning protection for maximum hardware safety
- Site diagnostics automatically spot missing ground and reversed polarity
- LAN signaling allows simple shutdown with interface kits for automatic data protection (400 and above)
- User replaceable, hot swappable batteries insure uptime safe disposal. Batteries will last 3-5 years under normal use.
- $25,000 lifetime Equipment Protection
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Model	Application	Sugg.List
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400	Desktop 486/386 systems	$199
450	Tower 486/386 systems	$254
600	CAD/CAM workstations	$359
900	Longer runtime	$529
1250	Multiple systems	$689

keyboard lockups, data loss, and crashes. With an APC UPS, you get six times the protection of a high-end surge protector for little more than twice the price. And $119 is much less expensive than false peace of mind. APC UPSs carry up to a $25,000 lifetime guarantee against surge damage to your properly connected equipment, and are available to suit any application, from network servers and PCs, to fax and satellite systems.

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It's been said that there are two types of computer users: those who have lost data, and those who are about to. Prevent the single largest cause of computer problems and join a fast-growing third category: those who protect their PC's with the most reliable protection they can buy: APC UPSes. So ask for APC at your favorite reseller. At just $119 an APC UPS is serious protection no serious computer user should be without.

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Two Hottest Internet Suites: One for Novices and One for Sophisticates

Two new Internet access programs cater to different audiences and offer the latest in ease of use and sophistication. Both are Windows 3.1 apps that will run under Windows 95, the vendors claim.

Quarterdeck's InternetSuite, a good choice for newcomers, automates the labor of establishing an Internet connection. For more experienced Internauts, Wollongong's Emissary software has some of the best-integrated tools we've seen.

Both products have interfaces that resemble the Windows File Manager, and both make customizing their interfaces easy. On the downside, both are missing key tools, such as Internet Relay Chat (IRC), though they let you use other vendors' tools.

InternetSuite is a terrific package if you don't already have Internet access. You can install the program and immediately sign up with any of seven national Internet service providers. If you prefer a local provider, it gives configuration information for 55 of them.

The package bundles crucial Net access tools—a Web browser, E-mail and Usenet tools, an FTP program, and a Telnet program, plus its own version of WinSock.

The Web browser is particularly nice. Unlike Netscape's popular browser, InternetSuite's lets you create folders by topic or frequently visited Web sites. InternetSuite also lets you open multiple Web pages simultaneously. (IDG, *PC World*'s parent company, is a part owner of Netscape.)

The rest of the package was unexceptional. The E-mail and News component, for instance, supports uuencode/uudecode for attaching binary files to messages, but not the newer MIME format.

Whereas InternetSuite is a loose collection of programs, Emissary tightly integrates the same types of tools into one interface, which makes switching among them painless.

Emissary offers several slick features: You can drag and drop binary files directly into E-mail (it supports uuencode/uudecode and MIME). It automatically decodes and displays images from Usenet newsgroups. You can click a file on a remote FTP server to load your word processor and display the file.

Like InternetSuite, Emissary makes it easy to organize your favorite Internet sites. But it can't automate connecting to Internet service providers, a serious limitation for newbies.

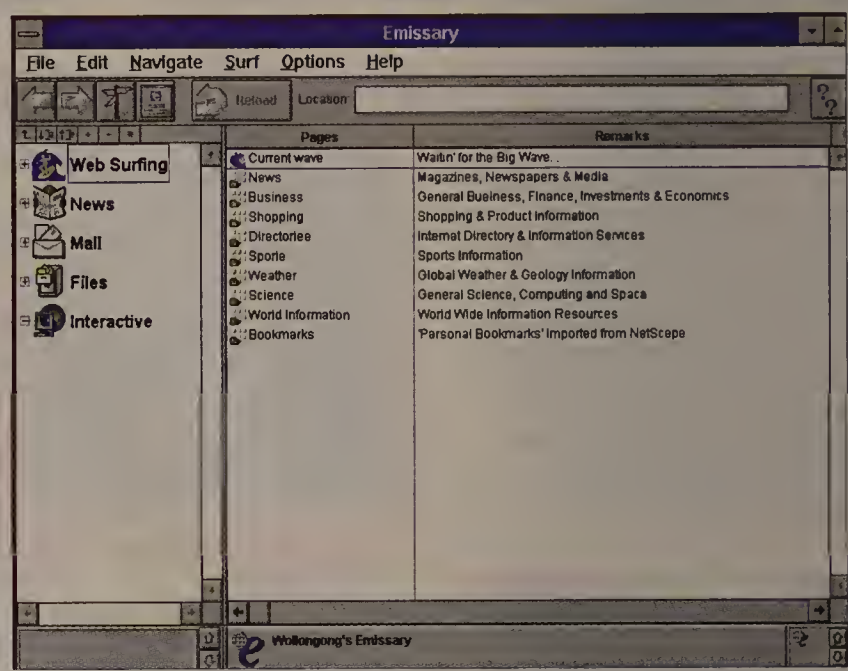
—Reid Goldsborough

Quarterdeck InternetSuite

Easiest way to access the Internet if you're not already connected.
Quarterdeck Corp.
800/354-3222, 310/392-9851
Street price: $79
Reader service no. 602

Emissary

Tightly integrated set of sophisticated Internet tools.
Wollongong
800/872-8649, 415/962-7100
Street price: $75
Reader service no. 603



EMISSARY DISPLAYS ITS INTERNET ACCESS TOOLS in the left pane; you surf in the right pane, which you can enlarge full size on screen.

A Faster LAN/Internet Connection

Farallon Computing's Netopia line of Internet routers provides a low-cost way to connect your LAN to the Internet via a high-speed 128-kilobits-per-second ISDN connection. Instead of forking out $400 per user for ISDN hardware, you pay for one router that can be shared. The two products of interest to businesses: Netopia 630, $800 for up to five users, and the $1000 Netopia 640, which supports an unlimited number of users on a standard ISDN line, according to the vendor.

The Netopia models cost much less than the most popular rival products, Ascend's Pipeline 50 series. Like the Ascend units, the Netopia routers include 4-to-1 compression, which can boost performance.

The Netopia line offers one of the best sets of administrative features. A Dynamic Host Configuration Protocol feature lets a Netopia router automatically configure networked PCs for the Internet. The Simple Network Manager Protocol (SNMP) lets your administrator—or even Farallon—manage the device remotely. One caveat: These devices don't work with some of the older Internet standards.

—Joe Abernathy

Netopia 630 and 640

Network routers that provide one of the cheapest ways to share an Internet ISDN connection on your LAN.
Farallon Computing Inc.
510/814-5100
Street price: Netopia 630 $800 (five users); Netopia 640 $1200 (unlimited number of users)
Reader service no. 604

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Timm is not just any computer monitor, because it's the world's finest 20" television, too. Which means you can hook Timm to almost any computer to play games, run CD-ROMs, or navigate the Internet, and then simply click the remote to watch TV or see videos—on the very same screen.

sharper than any television

There was no technology spared in creating Timm's astounding picture quality. The high-resolution, fine-pitch, FST Black™ screen and Invar Shadow Mask produce a dynamic picture with lifelike color purity and brilliant detail. On Timm, CD-ROMs have more clarity, games are more realistic, and television images are finer than ever before.

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Complimenting Timm's unsurpassed visual attributes is an audio system of equal distinction. Timm eliminates the need for external speakers with an incredible 10-watt sound system that reproduces the full range of CD quality sound. And its Sub Bass System delivers rich bass tones, further enhancing the extraordinary multimedia experience available only with Timm.

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See TIMM on Prodigy or on the Internet at www.hotwired.com/timm
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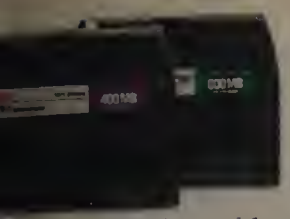
If this is your hard drive,



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3M *Innovation*

Circle 208 on reader service card

3D Fax: Not Your Ordinary File Transfer Program

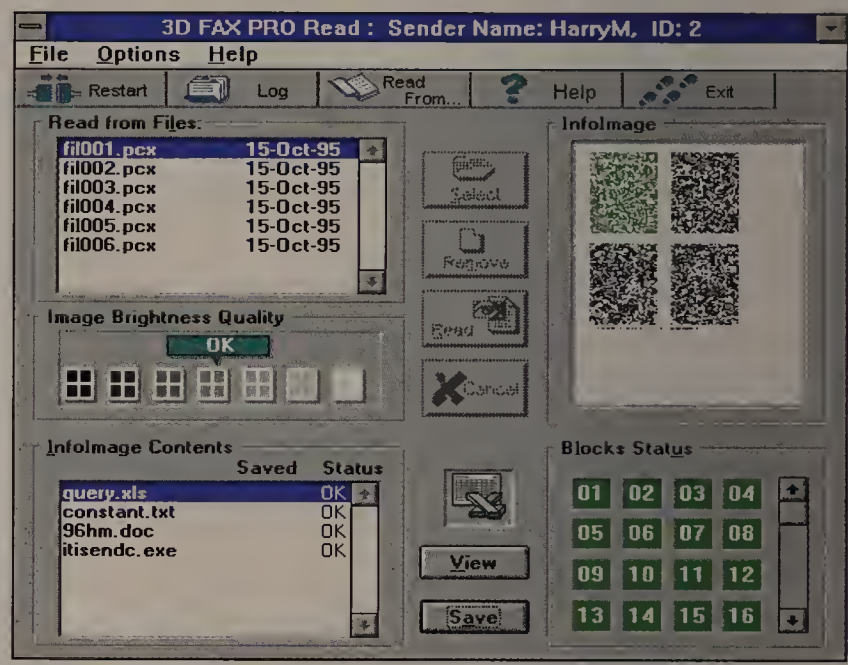
InfoImaging Technologies' 3D Fax Professional 1.5 turns the mundane task of transferring files into a geek's delight. But for all its novelty, this pricey $199 utility has limited practical use.

3D Fax is an add-on for fax programs like Delrina's WinFax Pro. When you select a file (or files) to send via 3D Fax, it converts the data into Rorschach-like pages of densely packed black and white dots that represent your data in highly compressed binary form, with optional encryption. 3D Fax transmits this special document using your fax package and fax-modem.

If you send the pages to another PC's fax-modem, the recipient uses a free 3D Fax conversion utility to turn the pages back into data. You can also send hard copy to a fax machine rather than a modem, in which case recipients must scan the pages and then use the 3D Fax conversion utility to re-create the data file.

This whole process is remarkably clever, but whether it's an advance over other approaches is another matter. As the vendor claims, 3D Fax lets you send data files to users who don't own modems—but only if they're among the far more select group who have scanners. Worse, my 3D Fax transfers always took far more time than conventional protocols like YMODEM, and transmissions can fail entirely with advanced fax machines, which shrink pages or otherwise alter them as they reproduce them. For all these reasons, 3D Fax's less inventive competitors—communications programs such as Crosstalk and traditional file transfer utilities like LapLink—still offer better ways for most people to send files simply, quickly, and reliably.

—Harry McCracken



3D FAX TURNS FILES INTO FAX DOCUMENTS, then converts them back into data once you've sent them.

3D Fax Professional 1.5

Unique but not entirely practical file transfer program.
InfoImaging Technologies
800/966-1140,
415/960-0100
List price: $199
Reader service no. 607

Put PCs and Macs on Speaking Terms

For many organizations, getting PC and Mac users to cooperate is like mediating a lengthy divorce—each side is convinced it's right, and something inevitably gets caught in the middle. Two new file transfer and translation products may be just what you need to get your files—and your coworkers—working together.

The latest version of DataViz's popular package adds a host of new file translators including TIFF, EPS, WordPerfect 6.1, and 1-2-3 release 5.0. There is also a preview feature that lets you take a look at the contents of a file, a useful capability if you want to translate only a portion of a file.

To translate a file, you select it—whether it's on a Mac disk or on your PC—and indicate a destination for the translated file. Conversions Plus identifies the originating application and presents a list of compatible file formats, depending on the platform. After you select the file format and click OK, Conversions Plus translates the file, loads the host application if available, and displays the file. Conversions Plus 3.0 currently supports Windows 3.*x* and is compatible with Windows 95.

If the people in your organization use the same applications but are split between the Macintosh and PC versions, Here & Now from Software Architects offers a solution. Unlike Conversions Plus, which requires you to translate the file from one format to another to share it and costs considerably more, Here & Now is completely transparent. So if an associate hands you a file created on a Mac with Word for the Macintosh, you'll be able to read and manipulate the file on your PC with Word for Windows without converting it. Here & Now lets you instantly read from and write to any Mac-formatted disk as well as other media. It currently supports Windows 3.1 only.

—Catherine Kenny

Conversions Plus 3.0

Translate files between Macs and PCs.
DataViz, Inc.
800/733-0030,
203/268-0030
List price: $149
Reader service no. 605

Here & Now

Read and edit files from a Mac disk on your PC.
Software Architects Inc.
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206/487-0122
List price: $85.95
Reader service no. 606

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With new high capacity Travan cartridges and Colorado Backup for Windows™ one-button automated software, the T1000 is the perfect match for your data. And, since it's from the world leader in tape backup, you know quality and reliability are built in. Call 1-800-810-0131 for more information.

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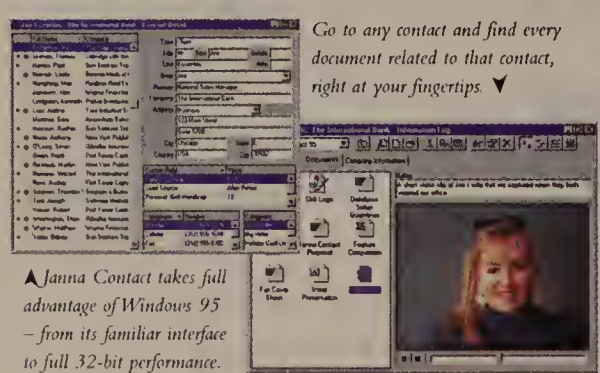

Go to any contact and find every document related to that contact, right at your fingertips. ▼

▲ *Janna Contact takes full advantage of Windows 95 – from its familiar interface to full 32-bit performance.*

Regardless of the application it goes with. Right at your fingertips, right from Janna Contact, exactly when you need them (which is "now", because your hottest prospect is calling). No fumbling around in other applications, scouring endless directories. Janna Contact 95 brings it all together in the one place it belongs – with your contacts. We call it integrated contact *and* document management. You'll call it brilliant.

You'll also call it really cool. Because it's the first contact manager that takes full advantage of Windows® 95, including full 32-bit performance, Explorer-style lists, multimedia, drag and drop and more. And the only contact manager that's certified Microsoft® Office 95 compatible. Which means it looks, acts and feels just like the world's best-selling suite. You'll be scheduling, e-mailing, faxing and phoning all over the place in no time. It's also networkable right out of the box, so you can share contacts and schedules, delegate tasks and collaborate on documents across your workgroup. Call for the name of a dealer near you. Or to take advantage of our $99* introductory price. You'd be crazy not to.

Designed for Microsoft Windows 95 — Microsoft OFFICE Compatible

Janna Contact 95

800 268 6107

For more information and a demo copy, log on: http://www.janna.com or CompuServe: GO JANNA. For information via fax: **800-525-8102**

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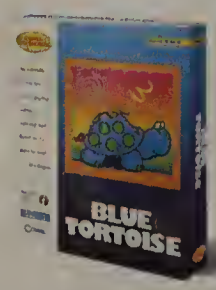

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intel inside pentium PROCESSOR

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Presto

Want to get a grip on the mountain of paper on your desk? Envisions' Presto lets you scan documents using any TWAIN-compliant scanner, convert them into editable text files (using Presto's built-in OCR software), and then organize the files into searchable folders and cabinets. You can also use Presto with your printer to make multiple copies quickly. If you have fax software and a modem, you can even fax from within Presto. The program lists for $149, but through September Envisions is distributing 100,000 copies free over CompuServe (**go envisions**) and its World Wide Web home page (**www.ocm.com/envisions**), or for a $9.95 handling charge if shipped by mail. The 16-bit program is compatible with Windows 95. Envisions Solutions Technology Inc., 800/365-7226, 415/692-9061.

Reader service no. 695

Snappy

In the old days, you needed three things to capture digital images from video: A degree in computer science, a small fortune, and the patience of Job. But you don't need any of these if you've got Snappy, a small plastic device—just bigger than a deck of cards—that plugs into your PC's parallel port, then connects to your camcorder, VCR, or TV. When the picture you want to capture appears, click the Snap icon, and in 1/60 second you get a video still. Snappy uses a new custom chip to capture 16.8 million colors at resolutions as high as 1500 by 1125. Once you've got your image, you can retouch it with the included special edition of Fauve Matisse. Or if you're feeling really creative, morph and warp your pictures with Gryphon Morph 2.5, also included. Snappy lists for $199.95. Play Incorporated, 800/306-7529, 916/851-0800.

Reader service no. 696

System Commander

Windows 3.1? Windows 95? Windows NT 3.5? OS/2 3.0? When you've got one computer and want to use different operating systems at different times, call on System Commander. For example, System Commander can help you try out Windows 95 while you're still running Windows 3.1. First load System Commander, then load each operating system. From then on, when you boot your PC you'll get a menu that allows you to select the OS for that session. To start a new session, you need to reboot and select a different OS. New features in version 2.0 include support for up to 100 operating systems on the same computer and up to 32 FAT-compatible OSes on a single partition. Version 2.0's documentation claims System Commander is fully compatible with Windows 95 and gives specific instructions on protecting your computer from Windows 95's quirks. List price is $99.95; a 10-user pack is $579. V Communications, Inc., 800/ 648-8266, 408/ 296-4224.

Reader service no. 697

ScreenPleaser

You've seen personalized wall calendars—with pictures of kids or pets plastered atop each month—but you may not know that you can also personalize your PC's screen saver. Here's how it works. Buy ScreenPleaser, then send artwork or a photograph to Quality Impressions, which will send you a personalized screen saver on floppy disk. A screen saver using one photo costs $19.95. You may incorporate up to three images on one screen saver; each additional image costs $5. If you have a sound card, you can also take advantage of ScreenPleaser's five prerecorded sound clips. The vendor says a Windows 95 version should be available by September. Quality Impressions Inc., 201/533-1433.

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Multimedia MBA: Corporate Edition

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Sportster Vi Fax-Modems with Personal Voice Mail

Modems do more these days than just exchange data. Take the newest models from U.S. Robotics—they'll also record phone messages. Sportster Vi modems—14.4 kbps and 28.8 kbps—automatically determine whether an incoming call is fax or voice. They then record incoming messages and store them in multiple voice mailboxes on your personal computer's hard drive. The modems will also call your electronic pager to alert you that a fax or phone message has arrived. You can use included software to broadcast a fax to a mailing list, send delayed faxes, forward an incoming fax to another location, and set up a fax-on-demand system. Sportster modems are VoiceView-enabled, which lets you switch between voice and data during one phone call, provided both modems support this protocol. The Sportster Vi 14.4 lists for $149 for the internal model and $179 for the external model. The Sportster Vi 28.8 (V.34) lists for $279 for the internal model and $299 for the external model. U.S. Robotics, 800/342-5877, 708/676-7010.

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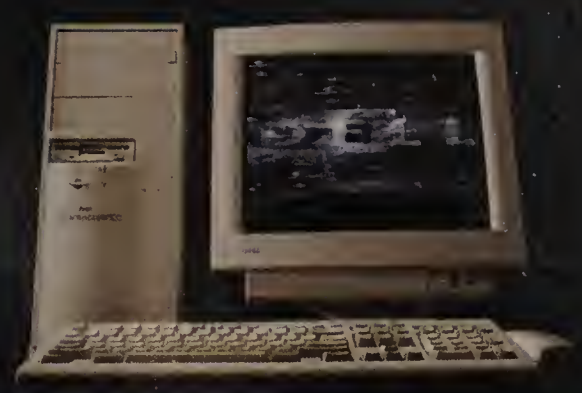

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Designed for Microsoft® Windows®95

TValue 4.0 for Windows

This program will help you perform loan, mortgage, and lease calculations, particularly amortization tables. An accountant might use TValue 4.0 to work out loan schedules, or a real estate agent might use it to demonstrate payment scenarios. You can do such work in a spreadsheet, but TimeValue Software claims this program simplifies tricky calculations—such as those involving irregular payment periods and changing interest rates. Version 4.0 is more customizable than past versions and includes a scaled-down spreadsheet. You can export or import text in ASCII to or from popular spreadsheets. On the downside, TValue will not import data from a spreadsheet or database. List price is $149; upgrade is $89. TimeValue Software, 800/426-4741, 714/727-1800.

Reader service no. 701

Harvard Spotlight 2.0 for Windows

Spotlight can help you hold an audience's attention and keep your presentations on schedule. With the control panel feature, you can view your notes and the current slide and preview the next. You can also use the annotation tool to mark up a slide for your audience. A status panel shows where you are in your presentation and lets you jump to other slides with a click. Timers show how long you've been gabbing and warn if you're behind or ahead of schedule. Shows can be imported from Harvard Graphics, Microsoft PowerPoint, and Lotus Freelance. An optional dual-display PC Card lets you present your slide show on a monitor while viewing the Spotlight control panel on your notebook, so your audience doesn't see it. Compatible with Windows 3.1 and Windows 95, Harvard Spotlight lists for $129, or $469 with the PC Card. Software Publishing Corp., 800/336-8360.

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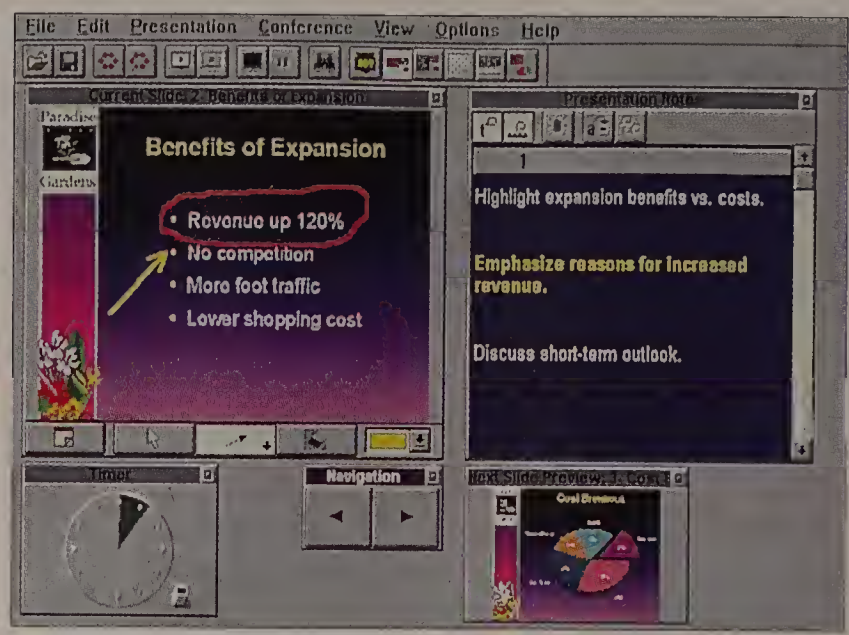

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StreetSmart 2.0

To create wealth is to add value, and any savvy investor determines the real value of a new acquisition before buying. So where is the added value in version 2.0 of Schwab's portfolio manager, StreetSmart for Windows? For Schwab account holders, it's convenience. A revamped interface makes trading and managing stocks, bonds, options, and mutual funds much easier. New graphing features let you track your portfolio as your coffers swell to Gatesian proportions. Also new in version 2.0 are Schwab's Mutual Fund Performance Guide, which is updated monthly, as well as a gateway for accessing Reuters Money Network. The bottom line: It's a great tool for the casual to intermediate Schwab investor, but tycoons should look for depth and specialization elsewhere. List price is $49. Charles Schwab, 800/334-4455.

Reader service no. 703

Congress 1.0

Would-be activists—not to mention every business manager who deals with government regulations or contractual issues—will appreciate a new lookup utility program that contains information on current state governors and members of Congress. All pertinent data is included on Congress 1.0's two floppy disks: addresses and phone numbers, party affiliations, committee assignments, and home districts or states. The software wisely avoids capsule treatments of issues such as voting performance and political leanings. Congress 1.0 is available as a stand-alone application for Windows 3.1 (it also runs under Windows 95) and Macintosh, or as a formatted database for ClarisWorks, InTouch, QuickDEX, or Info-GENI. List price for all versions of Congress 1.0 is $29. True BASIC Inc., 800/436-2111, 603/298-8517.

Reader service no. 704

Internet Chameleon 4.5 and Chameleon 32NFS for Windows NT 3.5

NetManage's latest Chameleon programs should ease Net access for traveling executives, allow workgroup collaboration, and reduce information overload. Internet Chameleon 4.5 features 18 applets and will run in 16-bit mode on any version of Windows. A helpful new address book gives quick access to 2000 online sites. At any Web site, you can easily log address and content information from the site into other Chameleon applications, using the "NEWT Shooter" feature. The package includes multimedia-enhanced E-mail that allows you to attach files that contain video and sound as well as text, automatic Internet account registration, a Usenet news reader, a Web browser, a file transfer program, and standard utilities. NetManage has also released version 4.01 of its 32-bit Chameleon 32NFS for Windows NT 3.5. This doesn't have all the new features of the 16-bit product, but includes full client and server applets for every significant Internet service, including a personal Web server. List price for Internet Chameleon 4.5 is $125; $799 for Chameleon 32NFS for Windows NT 3.5. NetManage Inc., 408/973-7171.

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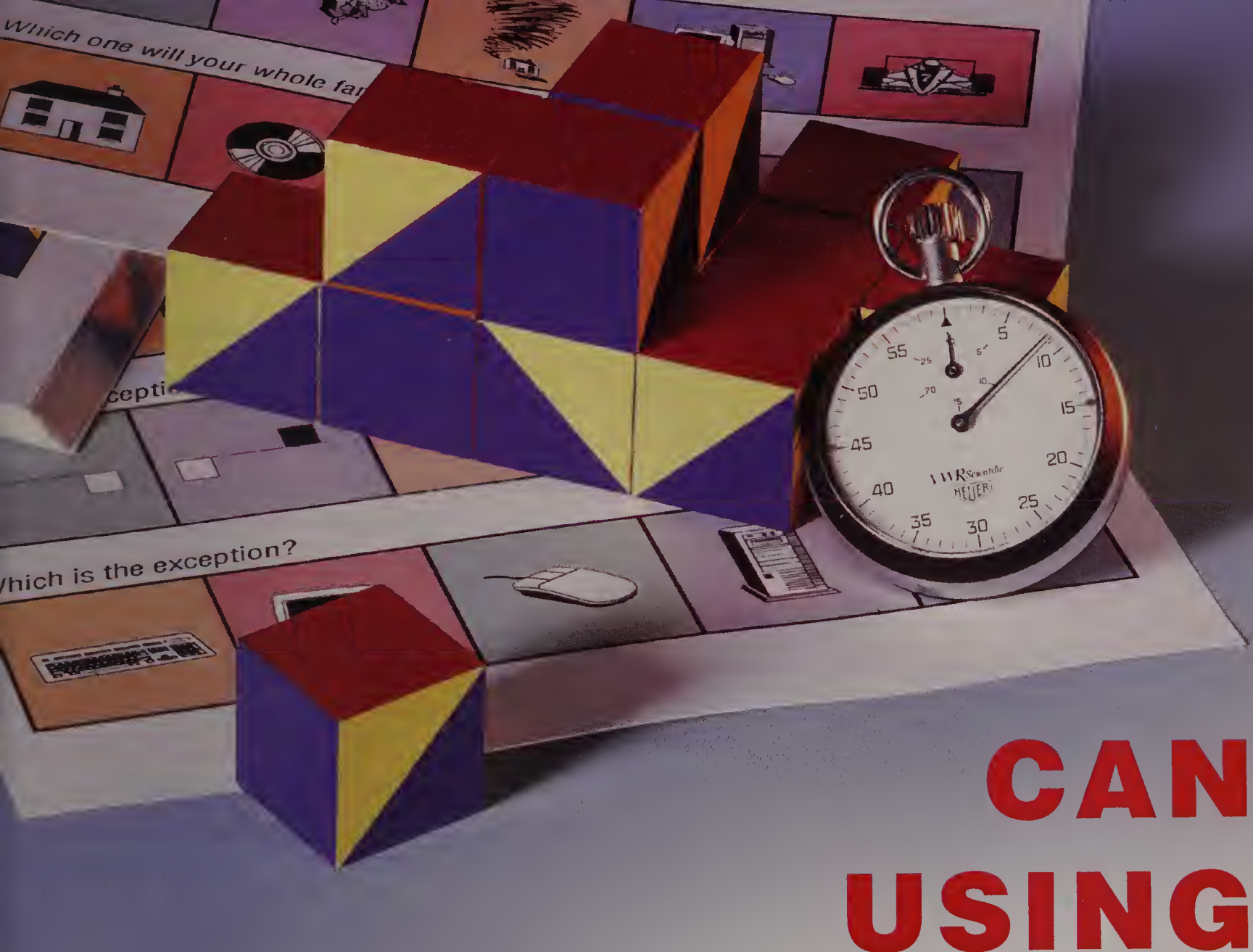
For more information about any product, contact the manufacturer or circle the number on the reader service card.



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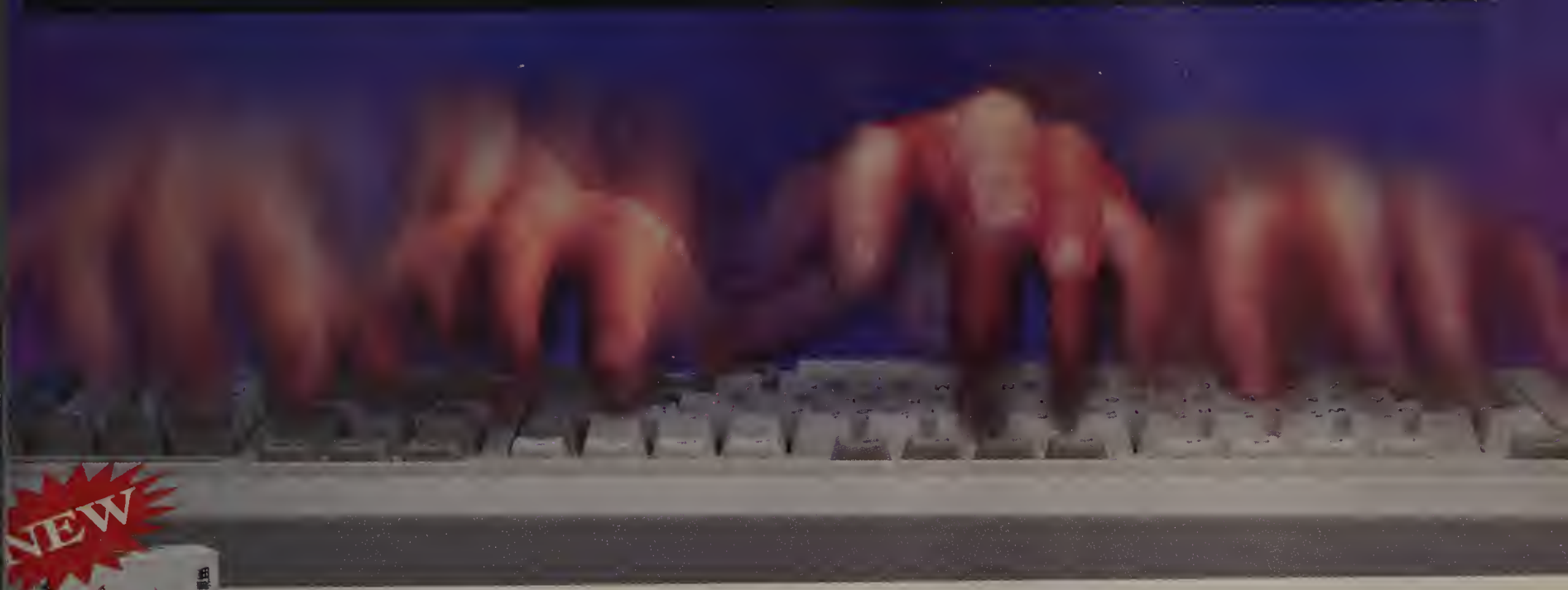

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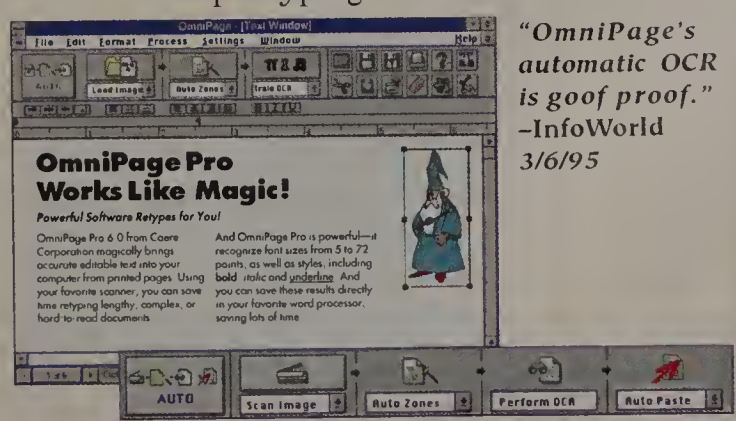

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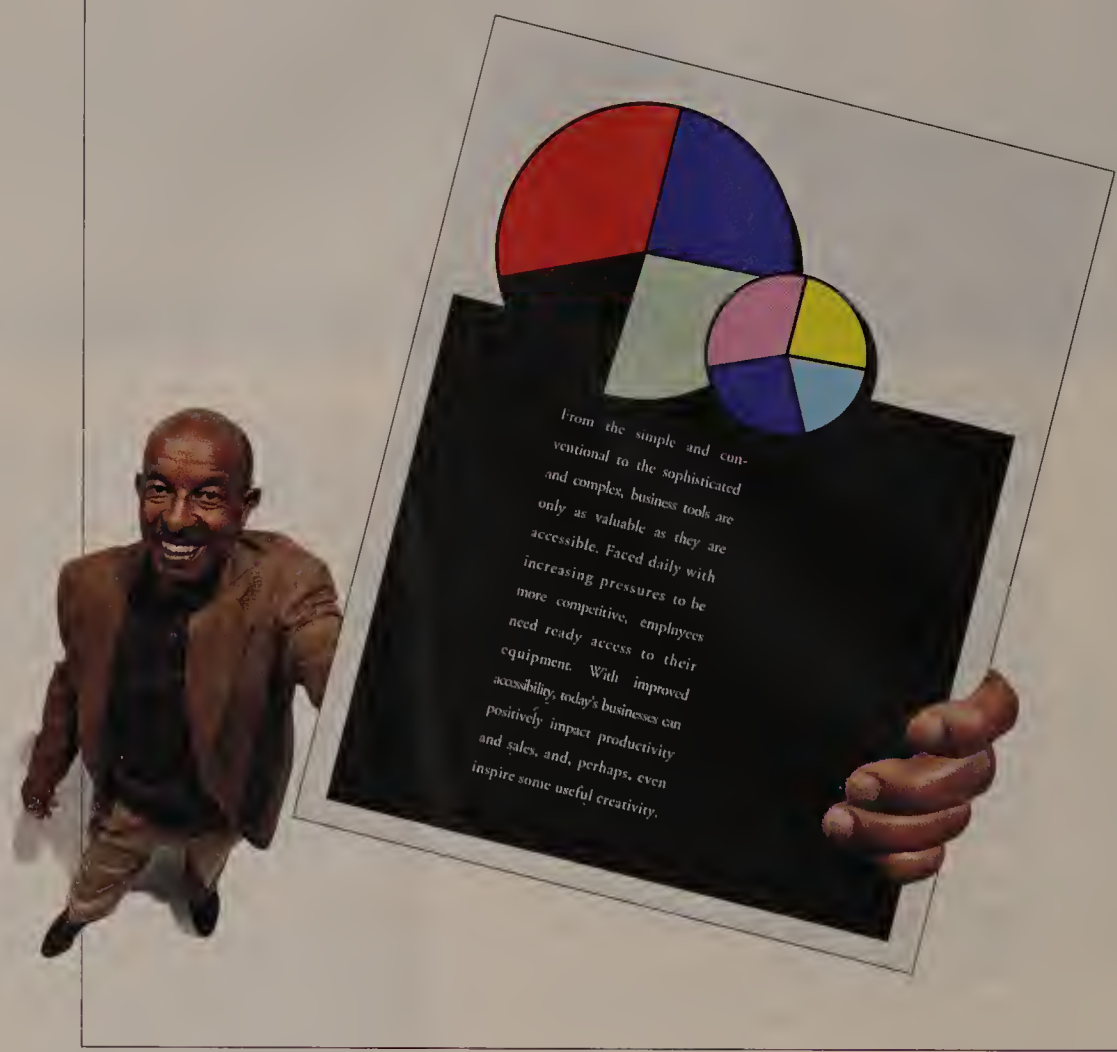
Circle 91 on reader service card



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DO-IT-YOURSELF Workgroup Software

A new crop of software brings the power of workgroup computing down to your desktop, under *your* control. Here are five packages that make teamwork easier and more productive—and don't require a computer professional to install.

114 Groupworks
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118 Insitu Conference
122 Common Ground
126 Delrina CommSuite

Edited by Eric Bender

ILLUSTRATION BY PAUL WATSON

Groupware for the Rest of Us

GroupWorks helps you run ad hoc project teams.

You've just been handed an important assignment and not quite enough time to complete it. You need serious help from colleagues in several departments, but you won't be able to drag them all into a conference room for days or weeks—if ever. How do you get everyone up to speed on the project so they can start on their tasks tomorrow morning? And how do you make sure nothing falls through the cracks once the project is under way?

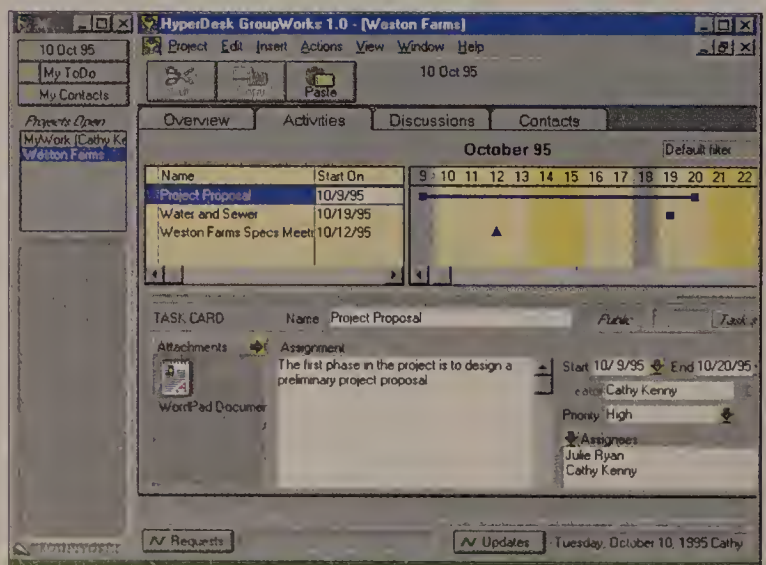
HyperDesk's GroupWorks is a do-it-yourself tool for this kind of project. It's a group application that lets ad hoc teams share and track project tasks, contacts, and meetings.

Such projects are thoroughly familiar to Dale Hackathorn, a manufacturing engineer for Cuplex, Inc. in Marlborough, Massachusetts. Cuplex builds network boards, and Hackathorn oversees customer projects from proposals through release to manufacturing, which is done both in Marlborough and in Cuplex's headquarters in Texas.

"In the past, when you went to a new product meeting, everyone would be assigned action items," explains Hackathorn. "These were then published and mailed to the appropriate people. Three of the five people involved would make some changes, you'd publish these, then the other two would make more changes, and you just kept chopping down trees."

WITH GROUPWORKS, DALE HACKATHORN'S TEAMS CONTROL new products from one focal point.

Now Hackathorn creates a project in GroupWorks, assigns the broad targets to the appropriate team members, and asks each member to fill in the necessary details. Hackathorn and his team then track the target completions via the software. "GroupWorks gives us overall project management capabilities and the ability to control new products from one focal point," he says.



TO SET UP A PROJECT, specify start and end dates and priorities, assign team members, and then click Publish to notify everyone.

Getting Going

GroupWorks is not installed on a server, but on individual PCs. The installation automatically handles network connections and otherwise keeps things pretty simple.

But you should keep in mind three potential problems. First, if you're running Windows 3.*x*, you must make sure that your autoexec.bat file contains the line Share /L:500 /F:5100. (If you're using Windows for Workgroups or Windows 95, don't bother.)

Second, GroupWorks may have difficulty selecting the correct protocol for your type of network. GroupWorks currently supports Novell NetWare, Windows for Workgroups, and LANtastic. During our installation, GroupWorks correctly identified Windows for Workgroups but suggested NetBIOS instead of the TCP/IP protocol we were running. All you have to do is click the correct box, but check with your network administrator first to be sure you have the right one.

Third, GroupWorks 1.0 sometimes messes up under Windows 95 and fails to deliver notifications properly. HyperDesk expects to fix the problem by the time you read this.

Once you've installed GroupWorks, it identifies itself to other PCs on the network that are already running the package. Project files are stored on the PC where the project was initiated. The networked PCs automatically swap information on where

the project files are located, so you don't have to worry about that. However, if the source PC is not logged on to the network, team members won't be able to access the project. One solution is to set up a host PC that is always running and hooked up to the network; owners can move their projects to this PC so others can access the files.

Launching a Project

Okay, once you're up and running, what exactly do projects look like in GroupWorks? The software defines each project in terms of four elements: Overview, Activities, Discussions, and Contacts. Each element is available by clicking a tab on the main GroupWorks screen.

The Overview tab allows you to assign the project name, description, start and end dates, milestones, and team members. To add members to a project, click the Team Members button and then select each one from the list of available GroupWorks users. If members of your team aren't using GroupWorks, you can set them up as external users via their E-mail addresses. (Most common mail systems are supported, although GroupWorks can't automatically grab user addresses.) Once you've identified users to GroupWorks, they receive notification of tasks and meetings by E-mail.

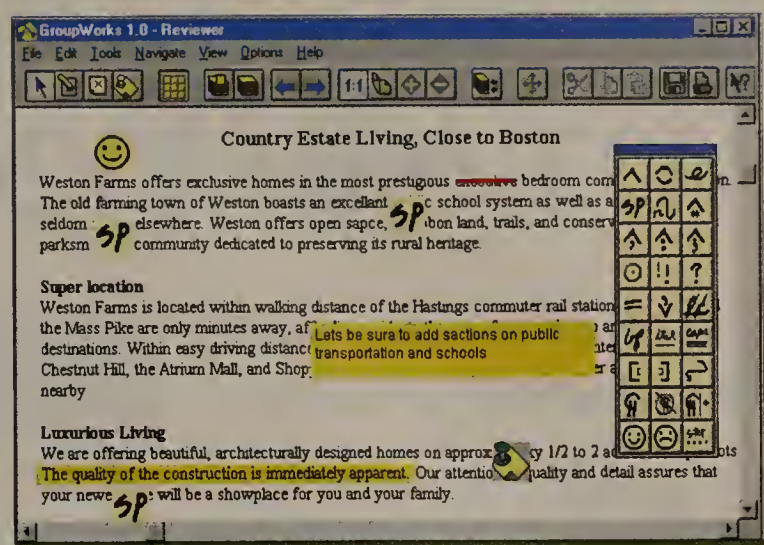
The remaining tabs let you define the tasks, meetings, discussions, and contacts associated with a project. In the Activities tab, users create Task and Meeting cards, including a project description, start and end dates, due date, priority, and assignees. Meeting cards let you include the meeting agenda and location.

The Discussions tab allows for threaded online discussions of project-related items. Any team member can start a discussion topic or participate in a discussion.

The Contacts tab stores project-related contact information. You can opt to keep your contacts private, or you can share them with other team members simply by clicking the Publish button.

GroupWorks helps you keep track of your projects in a variety of displays. You can view projects in calendar, outline, and timeline formats. You can also display combination views, such as showing a project timeline on the top half of the screen and an Activities card on the bottom half. You can avoid scheduling conflicts by displaying a time-line or calendar view at the top while creating new tasks at the bottom. (But GroupWorks won't stop you from overbooking yourself or others.)

In addition, you can attach word processing documents, spreadsheets, and other files to any card in a project and make them available for editing by any member of the team. Members who lack the originating application can still review the documents. The Reviewer, which works with virtually every Windows-based program, lets you annotate the document with comments and editing marks. Comments from all team members can be easily reviewed or printed.



WHEN YOU WANT TO SHARE DOCUMENTS, the Reviewer lets you annotate a document without affecting the original.

When you work on more than one project at a time, GroupWorks helps to bring together all the tasks and meetings you've been assigned in a single view called MyWork. This helps you coordinate commitments and avoiding cross-project conflicts. Although the MyWork tabs are slightly different—MyActivities, MyNotes, and MyContacts—their functions are essentially the same as a regular project's. Because tasks, meetings, discussions, and contacts can be created in MyWork and kept private, it's also a place to enter personal items, such as birthdays and doctor's appointments.

Work the Way You Want

Speaking of life outside the office, GroupWorks does provide support for the temporarily disconnected. If you need to work on the road or at home, you can copy a project to your local PC. When you return to the office, you can merge your changes back into the original project.

GroupWorks is flexible enough to allow for various management styles—from top-down control of all aspects of a project to a peer-to-peer style in which team members write their own project tasks.

It's also secure enough to safely keep track of sensitive tasks and projects. GroupWorks does not rely on the network to handle security but instead uses individual passwords to prevent unauthorized access to a project. Other security measures prevent users from tampering with a project. For instance, only a project's owner can delete items, reassign tasks, and perform other maintenance duties, and team members can remove or change only their own additions.

The next time you get an assignment that needs to be done yesterday, put GroupWorks on the job. You'll spend less time worrying about getting your team together and more time getting the project done.

—David Aden

David Aden is a freelance writer in Medford, Massachusetts who often covers network issues.

Three Tips for Doing It Yourself

1. **If you're using Windows 3.*x*, make sure the line Share /L:500 /F:5100 is in your autoexec.bat file.**
2. **Ask your system administrator what type of network protocol is in use.**
3. **Keep a list of E-mail addresses of colleagues you want to include in projects who may not be using GroupWorks.**

GROUPWORKS 1.0

This project software lets you coordinate teams without meeting face-to-face.

List price: $299, 3-user license $695, up to 15 users $2000; free 30-day trial available at http://www.hyperdesk.com.

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Write It Together

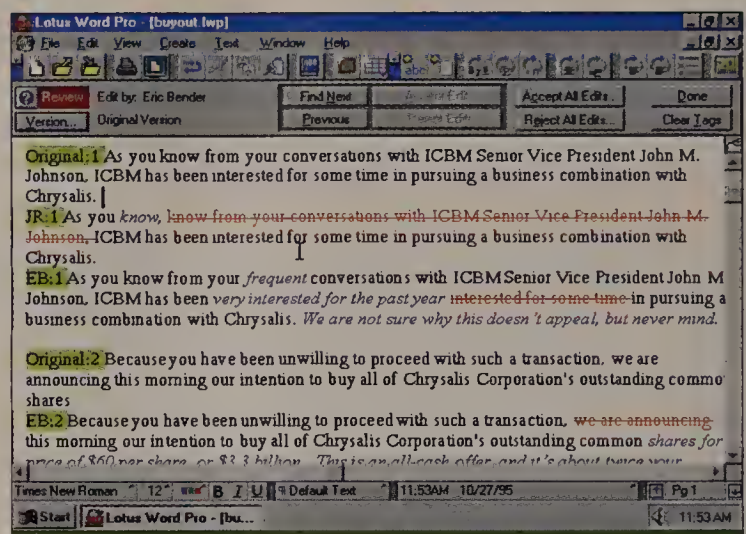
Lotus Word Pro offers aid for jointly editing documents.

"In Xanadu did Kubla Khan / A stately pleasure dome decree . . ." Samuel Taylor Coleridge sprang out of bed one morning with these words already formed and ready to puzzle generations of undergraduates. Sadly, you and I don't write business documents in this dreamlike fashion. We grind them out slowly and painfully, with lots of revisions from other folks. And when the time comes to put it all together, even trained professionals such as ourselves unleash blizzards of paper as we try vainly to keep all those versions straight.

Lotus Word Pro, a state-of-the-art word processor for Windows 3.*x* or Windows 95, can come to your rescue when documents are a group production.

Walk Before You Run

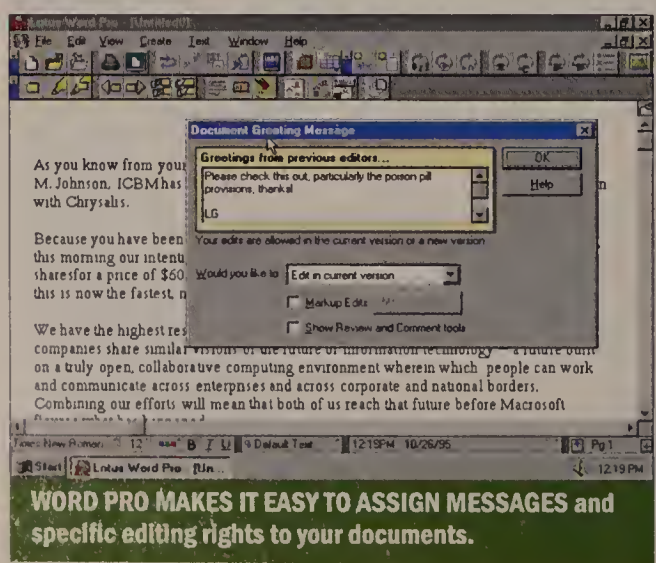
Once you've finished a draft, you can send it out to your colleagues or team members as you would any other file and let them edit it at will. There's a plethora of revision options, reached through a Review & Comment toolbar, and each colleague can pick a different color for his or her edits and highlights. Recipients also can attach sticky notes with text, graphics, or any OLE-based element, although I recommend that you skip these notes unless you really have a need for them.



THE TEAM CONSOLIDATE TOOL LETS YOU EASILY COMBINE versions into a single document and then review all changes.

Your collaborators whack away to their hearts' content and send the file back under whatever file name they like. You then bring it all together with *File•Team Consolidate*, which pulls all these files into a single document and preserves every edit and comment, including the names of each document reviewer. A Review Marked Edits toolbar pops up, which makes it easy to review each insertion or deletion and accept or reject what you like.

Alternatively, Word Pro lets you keep everyone's versions in a single file, in which only the most recent version is editable. But this option can be more work than it's worth: You need to review each version separately in order to see all the changes.



WORD PRO MAKES IT EASY TO ASSIGN MESSAGES and specific editing rights to your documents.

If you're feeling brave, you can orchestrate the entire process with Word Pro's Team Review Assistant. This feature lets you assign detailed editing rights (and even markup colors) for each document reviewer, post a greeting that appears when the file is opened, and request a comment when the file is saved. And you can restrict access—for example, perhaps some folks should read but not print out the file.

Team Review Assistant also lets you mail the document to your colleagues or even route it to them in a given sequence. But this is tricky to implement and may not be worth the trouble since regular E-mail can get the job done reasonably well.

Unlike its rivals, Word Pro is still missing integrated file-searching capabilities—a flaw that gets more annoying the more you share documents with others. (Lotus apparently assumes you'll use Notes to track everything.) But for cooperating on a document the first time around, Word Pro can't be beat.

—Eric Bender

Eric Bender is an executive editor at PC World, *which routinely assigns teams of at least six editors to articles like this one.*

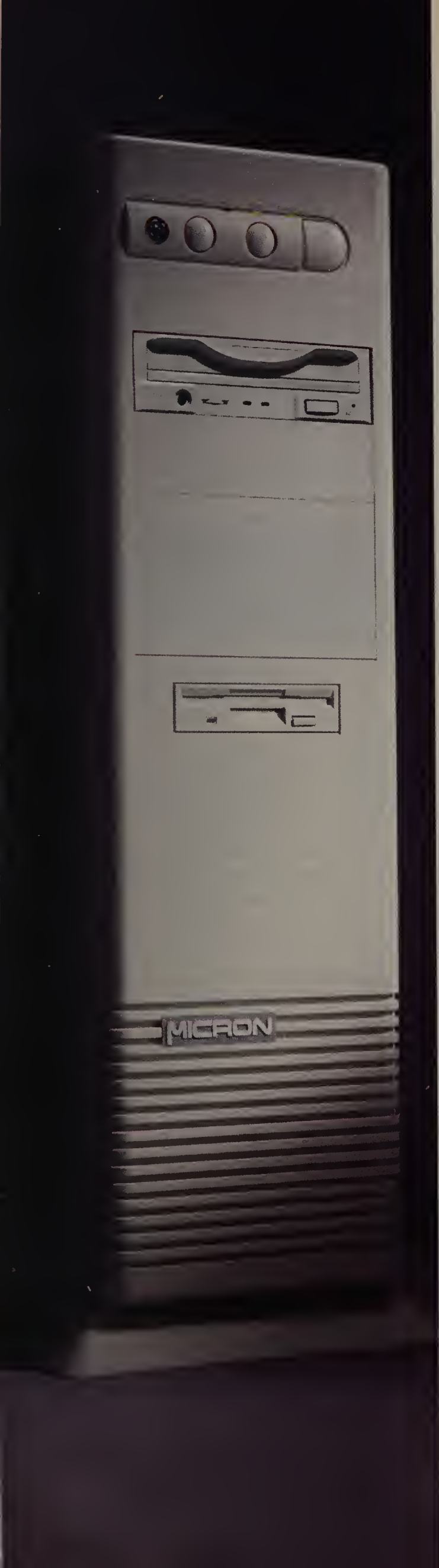
LOTUS WORD PRO
This word processor offers powerful tools for consolidating multiple edits.
Estimated street price: $105
Lotus Development Corp.
800/343-5414
Reader service no. 709

Three Tips for Doing It Yourself

1. **Choose View • Show/Hide • Review & Comment Tools to bring up revision-marking tools, but avoid sticky notes at first.**

2. **File • TeamConsolidate lets you view and combine edits from multiple users.**

3. **File • TeamReview gives you tight control over who gets your document and what they can do with it. But, at least initially, save the document as a file rather than mailing or routing it via E-mail.**



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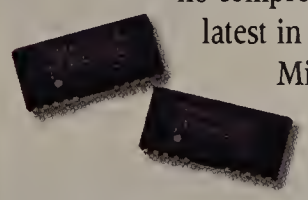
Only Micron can deliver server solutions built on such a unique heritage of award-winning speed, performance, reliability and service. And just like all Micron systems, the PowerServer SMP is engineered to meet the challenge of your most demanding information processing needs–with no compromise in system reliability. All PowerServers feature the latest in Intel's Pentium processor technology, paired with Micron's American-made RAM to give you an ideal combination of speed and ample memory.



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Circle 146 on reader service card

DOCUMENT CONFERENCING

Share a Virtual Whiteboard

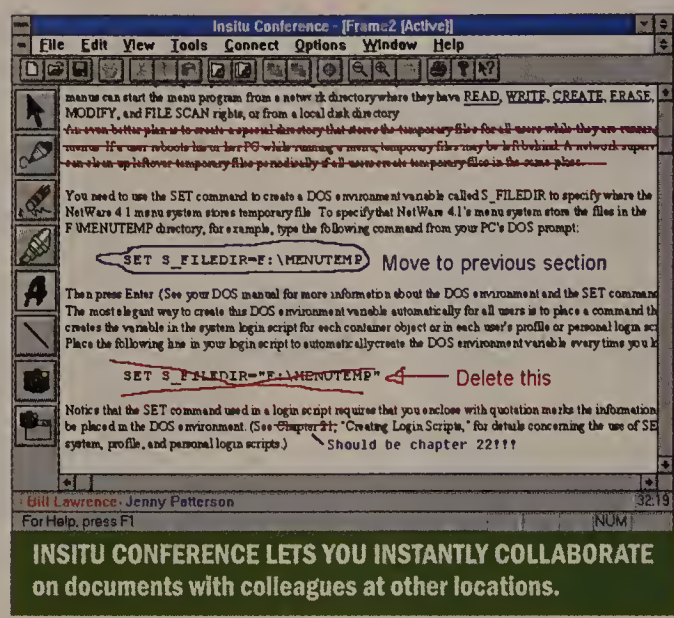
Insitu Conference lets you work with others anywhere.

When you work in New York and your boss is in California, phone calls and faxes are still not as good as being there. Bob O'Hara, a development engineer for Advanced Micro Devices, enhances his meetings with Insitu Conference, a Windows document conferencing package. "We use Insitu to jointly view information the way we'd share a piece of paper or a whiteboard if we were meeting in the same room," O'Hara says. "The fax machine just doesn't cut it anymore."

Insitu Conference lets multiple colleagues not only view and mark up documents remotely, but actively collaborate in developing them, and it works with the hardware they already own. It does require that your PC be equipped with the TCP/IP protocol.

Setting Up Sessions

Insitu Conference comes on two diskettes and is simple to set up and use. (One exception: You do have to know your TCP/IP address or network and host name if your network supports TCP/IP name resolution.)



INSITU CONFERENCE LETS YOU INSTANTLY COLLABORATE on documents with colleagues at other locations.

To launch a conference, you enter the names you've assigned to fellow Insitu users plus their TCP/IP network addresses (such as 128.213.56.90) or TCP/IP host names (such as bob.abc.com). The conferees receive on-screen invitation notices (via Insitu rather than regular E-mail), and you can have as many participants as you want.

Once in the conference, each participant sees a common Insitu screen. When you paste text or graphical information onto that screen (via the Windows Clipboard), each participant sees it too. Participants can mark up the on-screen information using a mouse or keyboard, and each participant can choose a unique annotation color. You discuss things via a conference phone call.

Insitu's screen capture feature lets you place whatever you can display on your PC screen into a conference. The package also is OLE 2.0 compatible, which means you can highlight information from an OLE-aware application and drag it onto an Insitu Conference screen, and then do some on-the-fly editing. Double-click the embedded information on the conference screen, and you launch the program that created the information. You work away on the information, and when you're finished, your fellow conferees automatically see your revision. Conference participants can even retrieve and save documents you've placed on the screen. When you're all done, Insitu saves the marked-up screens.

Overall, Insitu is a handy new tool that may offer the next best thing to being there.

—Bill Lawrence

Bill Lawrence helps manage a 3000-workstation network for a public utility in California.

"THE FAX MACHINE JUST DOESN'T CUT IT ANYMORE" after using Insitu, says AMD development engineer Bob O'Hara.

INSITU CONFERENCE

Remote users can work together on a shared whiteboard.

List price: $269 per user, $185 per user for 5 users, $149/user for 100 users; download a trial demo at ftp.std.com/vendors/insitu/demo.iconfl10.zip

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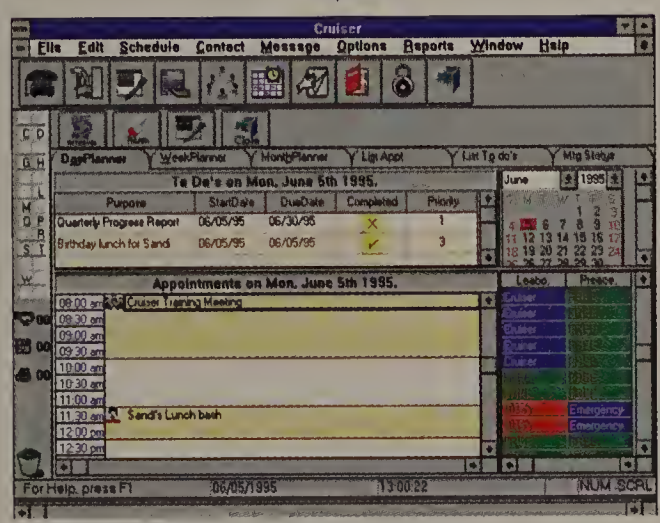
Three Tips for Doing It Yourself

1. **Be on, or be able to connect to, a net that supports TCP/IP.**
2. **Know your TCP/IP address, or network name and host name if your network supports TCP/IP name resolution.**
3. **Know the TCP/IP addresses or network and host names of your conferees.**

Your new assistant tracks down team members, keeps your appointments, handles all your communications flawlessly and doesn't even need a lunch break.



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Type I, Type-II and Type-III PCMCIA slots are available with optional modules. Specifications are subject to change.

DOCUMENT DISTRIBUTION

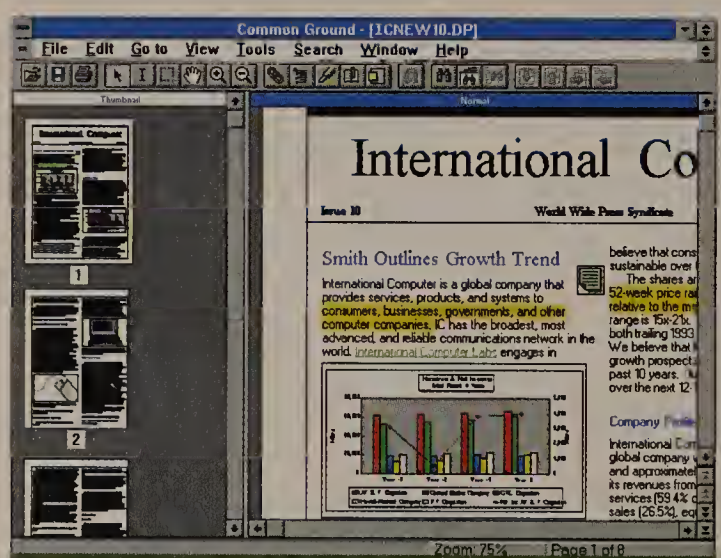
Publish Without Paper

Share graphical documents with anyone on a PC or Mac.

In the beginning there was paper. Next came ASCII, and then powerful desktop publishing programs with documents that were so complex they could only be distributed on paper.

Now there's "electronic paper"—documents created by programs like Common Ground 2.0. You can read, annotate, and print any Common Ground document on either a PC or a Mac. You don't need the originating application; you don't even need Common Ground.

For example, a crucial report can be distributed as a Common Ground document, and recipients can add their own bookmarks, highlights, and sticky notes. Layouts for an ad campaign can be sent from the art department's Macs to the agency head's PC for approval. Workgroup members can collaborate on a document by adding color-coded annotations, without having to standardize on one word processor.



STICKY NOTES AND COLOR-CODED HIGHLIGHTS help workgroup members review and collaborate on documents.

The process is very simple. Common Ground installs like a standard Windows application. You create a Common Ground document the same way you create a paper document, by selecting *File•Print*. But instead of printing your file to paper, the printer driver for Common Ground Maker converts it to DigitalPaper format, intelligently capturing your original document's text, fonts, graphics, and layout. You can then distribute the Common Ground document as you would any other electronic file. Recipients read the document with one of two Common Ground viewers—ProViewer and MiniViewer—which can be either embedded in the document itself or run as stand-alone applications.

Not Just Flipping Through Pages

Because Common Ground version 2.0 does more than grab a bit map, it's not just an electronic document delivery mechanism: Both publishers and readers can enhance and manipulate its DigitalPaper documents.

As publisher, you can help readers navigate a long file by generating a table of contents or creating hyperlinks. Readers double-click an entry in the table of contents or on a hyperlink source to reach the desired point in the document. Passages deserving special attention can be marked with color-coded highlights and sticky notes.

Common Ground's ProViewer lets you describe your document with a title, subject, author, and keywords, then exploit that information in searches. You can also prevent readers from printing, copying, or modifying sections of a document.

As reader, you can't edit the Common Ground document. But with the ProViewer (either stand-alone or embedded in the document), you can insert electronic bookmarks and add your own annotations. If you need to edit the document, the ProViewer lets you save it in any standard word processing format.

Because these documents contain actual text, you can search for words and phrases as you would in their originating applications. Common Ground has a Find command for simple searches on the current document. For more advanced searches across files, you combine documents into collections, then specify which collections to search.

Much more limited than the ProViewer, but free, the MiniViewer offers read-only access to document recipients, and files can be saved in ASCII format only.

A Common Ground document that does not include an embedded viewer is usually smaller than the file in its original form. An embedded MiniViewer adds about 200K to the file size; an embedded ProViewer, about 700K. Version 2.0 also converts files from PostScript apps, or files with EPS images.

The program is also smart about E-mail—you can mail a document directly from the ProViewer. Even better, you can mail Common Ground documents directly from within Word, Excel, Ami Pro, and WordPerfect.

Common Ground won't eliminate paper in your office, but it will often provide attractive alternatives.

—Ann Kremers

Ann Kremers is a senior associate editor for PC World.

Two Tips for Doing It Yourself

1. **Document publishers must install at least the Common Ground Maker and ProViewer. If you intend to convert PostScript files, select the PostScript option.**
2. **To convert and mail files directly from Word, Excel, Ami Pro, or WordPerfect, copy the included macros to your application directory.**

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FAX-MODEM SHARING

Give Everyone the Fax

Delrina's CommSuite for Networks offers fax and data communications to everyone in your group.

Suppose you want to let everyone in your group dial out to online services or other company offices, and also send and receive faxes electronically. Now suppose you lack the bucks to hang a fax-modem and a phone line off everyone's personal computer or workstation.

How you gonna call?

Peter Stambaugh, information systems manager for the Marine Engineers' Beneficial Association in Washington, D.C., solved this common problem with Delrina's CommSuite for Networks fax-modem–sharing package.

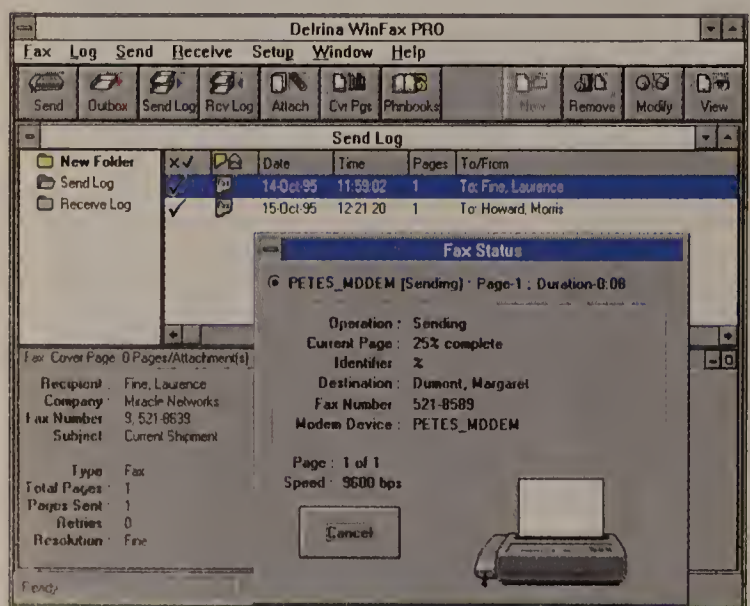
Employees at his district office can send faxes, transmit E-mail, tap into CompuServe support forums, access government information with a dialup Internet link, and distribute union news to branch offices in every major U.S. port—all over a single pair of fax-modems connected to a NetWare network. The result, says Stambaugh, is "better access to the information members need to know about union activities."

PETER STAMBAUGH DELIVERS ELECTRONIC INFORMATION to union members easily and inexpensively via Delrina's CommSuite.

Delrina's basic CommSuite package bundles the market-leading WinFax Pro PC faxing software with the WinComm Pro data communications program. CommSuite for Networks takes it further with its CommServer software that manages shared modems on NetWare, Artisoft LANtastic, Windows for Workgroups, Microsoft LAN Manager, Banyan VINES, and other common networks.

You can turn any Windows or DOS PC outfitted with a fax-modem into a server, and you don't have to dedicate the PC to that task. You also can run most up-to-date Windows communications packages with CommServer.

CommServer is one of the first packages to flexibly integrate both communications and faxing on the same hardware at the same time—no small trick. Some rival products "redirect" shared modems, taking data sent to a communications port on your PC and retransmitting it across the net to the modem. CommServer lets the server manage the fax or data link while the client sends data over the net. This approach allows for more robust fax transmissions, since faxes can get finicky when faced with any delays—even the short delays common on nets.



COMMSUITE OFFERS THE FAMILIAR WINFAX PRO plus data communications, working reasonably transparently over your net.

Getting Ready to Serve Everyone

This kind of package requires some care to install, but you don't have to be a rocket scientist to set up CommSuite for Networks. Note that CommServer comes as part of WinFax Pro and you install it as a client, a server, or both, while WinComm Pro is installed separately. CommSuite does a good job of locating and identifying fax-modems. It should work fine if you follow the instructions carefully and note our installation tips (see "Nine Tips for Doing It Yourself").

Using WinFax Pro to fax through a shared modem is easy, whether you send a document directly to the WinFax Pro printer driver through your application or go right into WinFax Pro on its own. Select a recipient from your electronic phone book or enter a name and number and off you go—an image of a fax machine pops up to show the status of your request.

With CommSuite, each client PC manages its own fax transmissions, rather than having a central server handle everything. This limits how you use the product. You can send faxes under your own name only from your own PC rather than any on the network. Also, if all modems are in use or if

the remote fax is busy, the fax is stored locally rather than on a central server. Your client software will notify you and will automatically try again later, but if you turn off your PC when you leave the office, be sure your faxes have been sent first. (A graphical monitoring tool lets you see who's hogging the fax-modems.)

And because there's no central fax storage facility, you must designate at least one "receptionist" PC to distribute incoming faxes—unless you're among the fortunate few with a phone system smart enough to be able to route inbound calls to individual fax numbers. If the receptionist PC is turned off, you can't get incoming faxes.

On the upside, it's a breeze for a designated employee to forward individual faxes via E-mail or WinFax, and you can set it up so the employee can read only cover pages.

As noted previously, WinComm Pro must be installed separately. For basic data communications, this is a good package. It's friendly enough to let most users configure it, dial a number, and connect to a remote computer without resorting to the manual. It offers a powerful scripting language and a graphical phone book, and it won't step on WinFax's toes.

Additionally, Delrina bundles the Internet Messenger (a basic Net E-mail reader) with WinComm Pro.

Most of us, though, will also want to use other communications tools such as Datastorm's ProComm, CompuServe's WinCIM front end, or a remote control package such as Symantec's pcAnywhere.

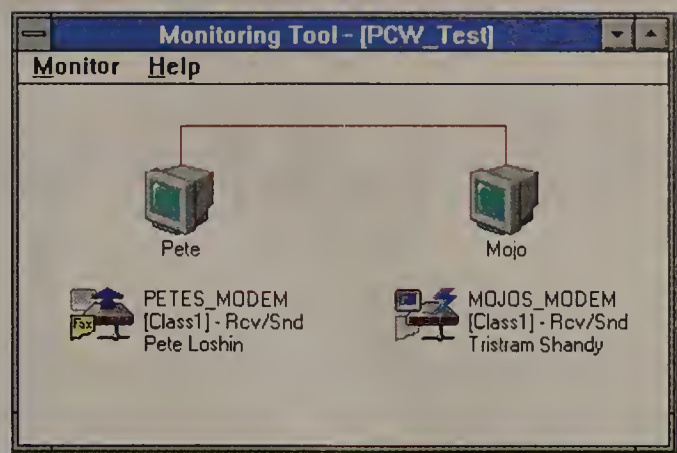
These tools should work well with CommSuite if they support one of two modem-sharing standards, Network Asynchronous Services Interface (NASI) or Network Communications Server Interface (NCSI). Warning: Older communications software may not support network-shared modems, so it's worth getting the latest version. Also, if you have a specialized Internet package, you should check with Delrina to see whether it will work with CommSuite.

Configuring third-party communications packages should be relatively simple. WinCIM, for example, takes two steps. In the Special/Setup Session Settings dialog box, you pick *NCSI* under Connector. Then, under LAN/General Name, you enter the data group name you previously assigned to CommSuite's shared modems.

CommSuite can also handle incoming data calls, after you designate a specific modem for incoming service to a given PC. However, this drags one of your modems and its phone line out of the pool. If you use a remote control program such as pcAnywhere to call into your office PC while you're on the road, that PC will monopolize the modem and line until you return.

You need to keep such idiosyncrasies in mind, but overall Delrina's package is one Suite solution for getting the most from your communications budget.

—Pete Loshin



IF THE FAX DOESN'T GO THROUGH or dialup doesn't connect, the Monitoring Tool shows what's happening (here one modem is handling a fax; the other, data).

Nine Tips for Doing It Yourself

1 You choose whether to make each PC a client, a server, or both when you first install WinFax Pro (which is how you set up CommServer). Client systems use shared modems; servers share their modems but can't use other shared modems.

2 Check the printed material inside your package for a server license number and a user capacity count (UCC) that encodes the number of users permitted on the server.

3 Keep track of client and server names as you install them; they're not managed in any central place. For simplicity, go with existing E-mail names if you have E-mail; otherwise, first name/last name is handy.

4 To configure shared modems, click the Set Up Fax/Modem button in the WinFax PRO for Networks Setup panel. When adding a modem, click the Check for Fax/Modems button to identify COM ports that have a modem attached; select a modemed COM port and click Test to configure it. WinFax gets this all working without making you dive into IRQs, modem drivers, and the like.

5 Once a modem is installed, you name it and then add it to fax and data working groups (which are just lists of modems you want to share for faxing and data communications respectively).

6 Only one person can modify a phone book that holds faxing and data communication addresses. Phone books with addresses that everyone uses should be on a shared network drive.

7 To load the CommServer at Windows startup on servers, drag the Load DLL icon into the Startup folder.

8 If a fax fails, try calling the number directly to hear if it answers with a message (as with voice messaging).

9 Exit WinFax Pro immediately after faxing to save Windows resources.

Pete Loshin, a Boston-based networking consultant, is the author of Electronic Commerce *(Charles River Media, 1995; 800/382-8505) and* TCP/IP for Everyone *(AP Professional, 1995; 800/321-5068).*

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**The VeriTest Cross-Country v2.0 test simulates typical executive use of Microsoft Office® applications in Microsoft Windows® 3.11 during an airplane flight. Power management was enabled and 8MB RAM was installed. VeriTest, inc. is located in Santa Monica, CA. Promotional pricing featured is not discountable. †For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., 2214 W. Braker Lane, Building 3, Austin, TX 78758. ◊Business leasing arranged by Leasing Group, Inc. ★Prices and specifications valid in the U.S. only and subject to change without notice. Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation. The Intel Inside logo and Pentium are registered trademarks and IntelDX4 is a trademark of Intel Corporation. ©1995 Dell Computer Corporation. All rights reserved.

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New Software *for* Windows 95

30 TOP APPLICATIONS AND UTILITIES FOR THE NEXT GENERATION

Edited by Lincoln Spector

Oh, no! Not another article about Windows 95?! Well, yes, but this one is different. No, really.

Why? Because we're not here to talk about the operating system itself. Well, not much, anyway. Instead, we're going to tell you about the first generation of programs being written for it.

And we've got a lot to tell—the result of taking a good hard look at prerelease beta versions of 30 Windows 95 applications and utilities. We assigned our best writers and columnists to categories like word processing and spreadsheets, forced them to run buggy, unfinished applications on top of a buggy, unfinished operating system, and then asked them to tell their tales. The outcome? For them, more gray hairs; for you, an overview of the next generation of software.

Of course, you don't *have* to buy new applications, even if you do buy Windows 95. Your Windows 3.1 applications will run just fine. But well-designed 32-bit Windows 95 applications will run even better.

For one thing, they'll be more responsive. Thanks to *preemptive multitasking*, in which programs share CPU time in a reasonable manner, and *multithreading*, which is multitasking within a single application, you won't spend as much time waiting while your computer displays hourglasses.

And let's not forget about long file names—probably the best reason to upgrade your applications. Ask any Macintosh or OS/2 user: You don't know how much those eight-dot-three limits enslave you until you've set yourself free. Believe me, a file called 'Letter to Steve about purchases--10-10-95.doc' is a lot easier to deal with than one named Stpr1010.doc.

A word processor that doesn't know about long file names is an inconvenience, but a defragger or backup program with similar ignorance can truly mess up your system. And anything that works close to the machine, such as a disk repair program or a memory manager, just won't work with an OS it wasn't designed for. The bottom line: Upgrading your applications may be optional if you move to Windows 95, but replacing all your utilities is absolutely necessary. So take a good look at the utilities we preview.

And these are *previews* you're about to read—they're based on examinations of unfinished beta software. Since final products are usually faster and cleaner than betas, we won't be reporting on bugs or performance issues here. Full reviews will have to wait until we get finished code.

Many important programs still in the works weren't ready for us to preview. For those, we pass along whatever information we can glean, even if it's only what the vendors were willing to tell us. Look for "On the Horizon" in each section.

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RICHARD DOWNS

Suites and Integrated Packages

OFFICE WITH THE WORKS

BY GEORGE CAMPBELL

Seems like everyone is using office suites these days, and all these people have the same question: Will there be a good Windows 95 version of their favorite suite?

The answer: Probably. Microsoft Office for Windows 95 was the only new suite ready in time for me to look at, and it's taken a big step towards being more than just a collection of applications.

But let's not forget the little guys. Low-cost integrated packages, once the easy-to-scorn Cinderellas of the software world, are now powerful alternatives to more expensive and hardware-hungry suites.

Microsoft Office for Windows 95

When you put Word, Excel, PowerPoint, and Schedule+ in the same box (plus Access in the Professional edition), is the whole worth more than the sum of its parts? The answer, finally, is yes. All the separate programs in Office for Windows 95 are discussed elsewhere in this article.

Office 95's most exciting new feature is the Binder, which acts as a collection point and work center for multiple, related documents created in different applications. Add elements of a project (documents, spreadsheets, database reports) to the Binder window, and you can create a single file of all the parts. Click the icon for one element in the Binder, and the menu and toolbars from the appropriate application pop up. Then you can print, E-mail, or copy the entire project as one unit. The whole thing works superbly with Windows 95's Briefcase to keep multiple, group-edited versions current, no matter where they originated. The benefits for workgroups are obvious, since the entire project can be kept together.

Office 95 works with Lotus Notes through Notes/FX, Microsoft Mail, and Microsoft Exchange, and it has hooks to Microsoft BackOffice for help with communications and network management chores. These file viewers can be freely distributed to others who do not have the Office suite installed, so they can read your documents.

The number of shared components in Office 95 is staggering. There are the OLE 2.0 miniapps such as Clip Art Gallery, WordArt, and Microsoft Query, plus shared code in DLL files that makes the applications look and work alike and cuts down on hard disk and memory requirements.

Despite these savings, Office 95 is a disk hog. You'll need 55MB for a typical installation—and up to a whopping 89MB if you install all the optional features. The suite will run in 8MB of RAM with a couple of its applications open, but even then performance can be sluggish. However, 16MB of RAM makes everything run smoothly, without much hard disk thrashing.

Overall, the new Office is a great tool. For those who have speedy hardware with plenty of RAM and hard disk real estate, it'll be hard to say no to this combination.

• **Microsoft Office for Windows 95** list price $499, upgrade $209 to $249; professional edition (includes Access) $599, upgrades $309 to $349; Microsoft; 800/426-9400

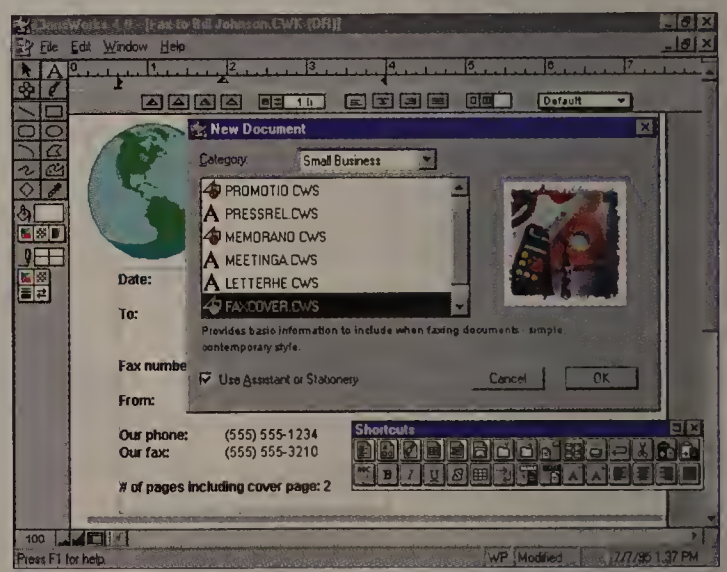
Reader service no. 772

ClarisWorks 4.0

Long available for both the Macintosh and Windows, ClarisWorks' main claims to fame have been its small requirements for hard disk space and its compatibility across platforms. Although the early prerelease version I looked at was incomplete, with many modules missing or not yet fully functional, I could see that ClarisWorks is a distant second to Microsoft Works for Windows 95.

Claris's templates are no match for Microsoft's wizards, and without OLE 2.0 support, you won't be able to link up with other programs' objects. If you use other Windows 95 products, you'll find the transition between their familiar interfaces and ClarisWorks' nonstandard screens confusing.

Not that the program is a complete loss. For one thing, it's very easy to use, with three new interactive help Assistants that walk you through the process of creating new documents. You can drag and drop from a bundled library of clip art images or draw directly in a document. Claris has bolstered the word processor with drop-down style selection, an integrated outliner, section breaks, end notes, and mail merge.



Claris Works provides a small number of preformatted templates to help you get started on a project.

Because it keeps its feet in both the Mac

Microsoft Office Binder lets you create a complex document out of parts created in any Office module.

and PC domains, ClarisWorks 4.0 doesn't make maximum use of Windows 95's features. There's no OLE 2.0 support, and the program doesn't do any multithreading. On the positive side, it offers right-mouse-button support, long file names, 3-D dialog boxes, and a Windows 95–like Taskbar in the program menu for quick access to minimized modules.

If you're already a ClarisWorks user, this is a worthwhile upgrade, if only for the long file names. But its lack of power and nonstandard approach to Windows 95 will make it unattractive to others.

• **ClarisWorks 4.0** list price $99, upgrade $49; Claris Corp.; 800/544-8554

Reader service no. 773

Microsoft Works for Windows 95

Powerful and easy to use, Microsoft Works for Windows 95 is a winner at the starting post. Users who don't want the massive power or price tag of Microsoft's Office 95 suite may just find that Works does everything they need.

From the opening screen, every step has either been simplified or has been given a corresponding interactive help facility. TaskWizards step you through each phase of creating projects, from simple letters and address books to accounts receivable databases and mortgage and loan analysis reports. At each stage, Works offers options for styles, with previews to show you exactly what you'll get when you make your selection. Naturally, you can start from scratch, but the included templates are excellent.

Microsoft Works can handle Microsoft Office for Windows 95 word processing and spreadsheet files (and vice versa), making transitions from one to the other almost seamless. Finally, the CD-ROM version of Works comes with Bookshelf 95, for integrated access to a dictionary and other reference materials. The package fully supports OLE 2.0 and comes with several OLE miniapps. However, we found no evidence of multithreading.

It's hard to resist a product that can completely handle the needs of home-office and small-business users and fits in 20MB of hard disk space. If you don't need the full power of an office suite, Microsoft Works for Windows 95 is your best bet.

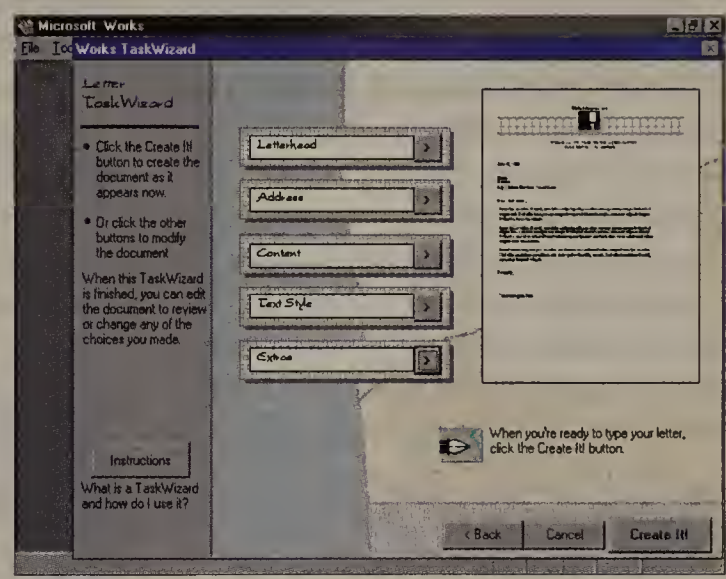
• **Microsoft Works for Windows 95** list price, floppies $54.95, CD-ROM version with Bookshelf 95 $79.95; Microsoft; 800/426-9400

Reader service no. 774

On the Horizon

If there are any other integrated programs out there, they're hiding from *PC World*. But other Windows 95 suites are on the way.

SmartSuite for Windows 95 will include a task-oriented toolbar for accessing the suite components, improved workgroup tools, a common scripting language, tighter links to Notes, and more SmartAssistants. (The 1-2-3 component may ship later than the rest of the suite.) PerfectOffice 7.0 promises more shared code between its applications, plus better cross-application assistants.



This Microsoft Works wizard—one of dozens—steps you through creation of a business letter.

• **PerfectOffice 7.0** price not yet available; Novell, Inc.; 800/451-5151

Reader service no. 775

• **SmartSuite for Windows 95** price not yet available; Lotus Development; 800/343-5414

Reader service no. 776

SUITES AND INTEGRATED PACKAGES AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
Claris Works 4.0	fall 1995	Requires small space on hard drive; easy to use but lacks power.
Microsoft Office 95	now	A powerful, massive collection of excellent, well-integrated business applications.
Microsoft Works 95	now	An ideal integrated package for most small- and home-office users.
ON THE HORIZON		
PerfectOffice 7.0	late 1995	Not available for preview.
SmartSuite 95	fall 1995	Not available for preview.

Utilities

TOOLS RUSH IN

BY SCOTT DUNN

While you can upgrade to Windows 95 and continue to use your old applications, you must get new utilities. File managers, disk maintenance utilities, and backup programs are going to run into trouble with Windows 95's long file names. Luckily, a number of utilities—many of them useful and some vital—are following close on the heels of Windows 95. Here are some of the first you'll be seeing.

Colorado Backup for Windows 95

This is an improved version of Win 95's own backup program, which Colorado Memory Systems developed for Microsoft in the first place. Colorado Backup does little more than expand its hardware base: It now works with tape drives that have their own controller boards, such as the Colorado T1000; SCSI devices like HP's PowerTape series; and Colorado's new Jump 1400 drives.

In addition, the Tools menu of the new Colorado Backup is a tad more full-featured: You can rename and retension tapes, as well as perform a quick erase or a secure erase. You can even unerase an erased tape.

If Windows 95 doesn't support your tape drive, it won't cost you much to try this upgrade. You can download it free from Colorado's BBS or as **cbu95.exe** from PC World Online. An official upgrade kit, complete with manual, costs $24.95.

• **Colorado Backup for Windows 95** free download, full package with manual direct from vendor $24.95; Hewlett Packard's Colorado Memory Systems Division; 800/416-8596, 970/635-0650 (BBS), ftp: hplvopen.1uld.hp.com

Reader service no. 777

Drag and File for Windows 95/NT

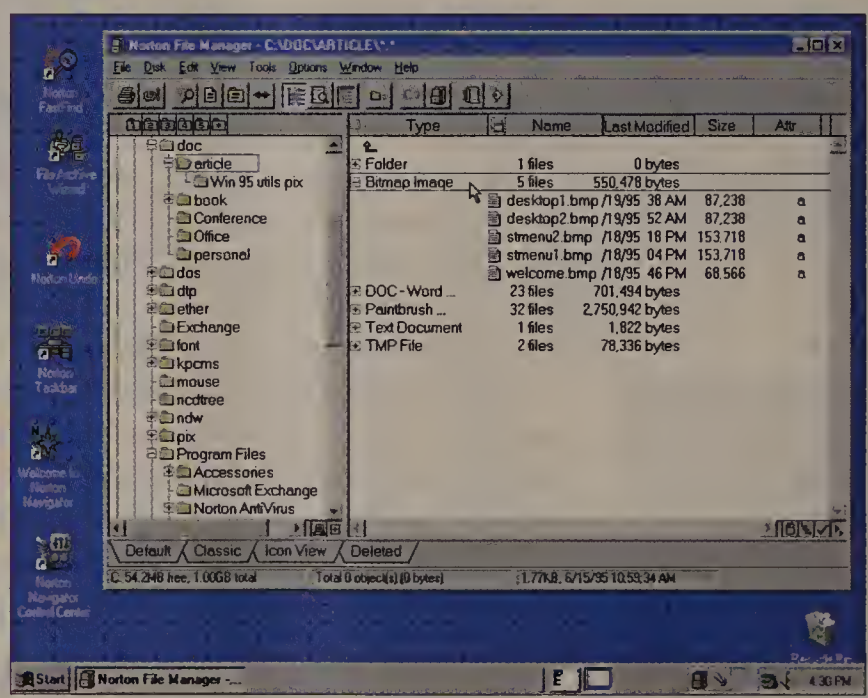
If Windows' Explorer lacks your favorite File Manager features, check out this shareware Explorer–File Manager hybrid. As with Explorer, you can right-drag or right-click for a pop-up menu of appropriate items, and expand and collapse folder branches without opening multiple folders. File Manager fans can still use wild-card characters to rename, copy, or move multiple files, as well as filter the file list.

But Drag and File has its own peculiarities. Unlike Explorer, its file list icons are always small and its toolbar icons are always large (a little *too* large for my taste). But window management is distinctly better than in Explorer: You can set how you want your file manager windows tiled. But you can't save multiple windows for later reopening, as you could with File Manager. And although its find feature isn't as robust as Explorer's, Drag and File does let you search for files containing particular text.

Finally, Drag and File includes some nifty features that Microsoft apparently never thought of: You can display an unobtrusive DOS command prompt below the status bar for easy typing of the occasional DOS command. A separate, floating drive bar lets you open Drag and File windows for individual drives with a single click. And you can print directory or file lists. Available as **df95.zip** on PC World Online, Drag and File is a great little program.

• **Drag and File for Windows 95/NT** registration fee $35, bundle with Drag and Zip $55, upgrade $25; Canyon Software; 800/280-3691 (sales only), 415/453-9779, 415/453-4289 (BBS)

Reader service no. 778



Norton Navigator's outline gives you a collapsed view of your files.

The Norton AntiVirus 4 for Windows 95

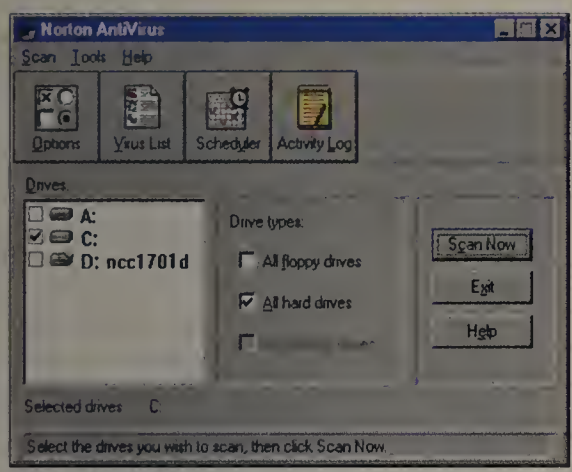
Windows 95 sure is backward compatible—it can successfully run more than 3000 known viruses. Unfortunately, your old antivirus program won't perform so well. Its automated background checking won't work in Windows 95, and it may corrupt long file names. Symantec's solution is The Norton AntiVirus 4 for Windows 95.

Users of the Norton AntiVirus 3 for Windows will see little difference. You get the same basic features of scanning (searching for known viruses), inoculation (watching for changes in designated files), autoprotection (transparent background monitoring), writing an activity log, and scheduling (to set up a scan at a date and time you designate). You can easily upgrade your virus definitions.

In short, there's nothing here that is really new. The point is that you need an antivirus program, and Norton AntiVirus is an easy-to-use and dependable one.

• **The Norton AntiVirus 4 for Windows 95** street price $79, upgrade for owners of Norton Desktop, PC Tools, or Central Point AntiVirus $29; Symantec; 800/441-6054, 503/334-7474 (fax)

Reader service no. 779



The interface for the new Norton AntiVirus looks just like the old version's.

The Norton Navigator for Windows 95

As I said, Drag and File is a great little program. The Norton Navigator is a great big one. Billed as the successor to Symantec's PC Tools and Norton Desktop, Navigator is in many ways a whole new ball team. Yes, I said *team*, and as with any team, you're likely to prefer some players to others.

The heavy hitter is Norton File Manager, a powerful, cluttered, and customizable jack-of-all-shells. Like Drag and File, Norton File Manager attempts to keep the best of both Explorer and File Manager: You can use wild cards to filter, copy, rename, and move files, and the right mouse button brings up an appropriate pop-up menu.

Methods for viewing and sorting file lists abound in Norton File Manager. You can reorder columns of file details by dragging the column headings. You can sort in complex, hierarchical ways. You can even view files in a collapsible outline.

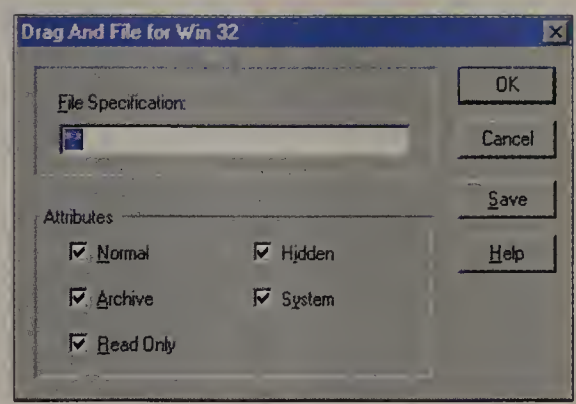
Want to get to a file or folder quickly? Just start typing the name, and you'll soon be there. If you still can't find what you need, Norton's search capability is as good as it ever was—or even better, since you can now index your files for faster text searches. Norton File Manager also offers encryption, undelete capabilities, and built-in PKZip-compatible compression.

If you don't like Norton File Manager, you can change it—many times—by assigning multiple configurations to folderlike tabs along the bottom of the window. Almost anything can be revamped, including keyboard shortcuts, toolbar icons, and menus.

And if you *really* don't like Norton File Manager, you don't have to use it. Navigator has placed many of its own enhancements, such as file compression, encryption, and the file-copying dialog box, into Win 95's own right-click menus. Also, a right click on a folder will bring you cascading menus of the folders within—a very handy way to navigate your system.

Then there's the Taskbar. Navigator lets you organize your Documents menu by grouping the files listed by type, and it turns the Start menu's Run command into a submenu of the last several items you opened. You can also put launch buttons directly onto the Taskbar, which can also contain a graphical view of Navigator's multiple desktops—if you use multiple desktops.

Norton Navigator also enhances the common file-handling dialog boxes for both old



Unlike Explorer, Drag and File lets you use wild cards to filter file lists.

and new applications. Now when you save or open a file from most Windows 3.1 apps, you will be able to move, copy, delete, rename, and view it, plus make new folders. Better yet, you can use long file names in old applications—a great money saver if it

UTILITIES AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
Colorado Backup 95	October 1995	If Microsoft Backup doesn't work with your tape drive, you'll need this minor upgrade. Otherwise, skip it.
Drag and File 95/NT	August 1995	Provides a good compromise between Explorer and File Manager at a reasonable price.
Norton AntiVirus 4	August 1995	An antivirus package is vital in Windows 95, and this one's a good choice.
Norton Navigator 95	August 1995	Replaces PC Tools and Norton Desktop with a mixed bag of enhancements, some very exciting.
Norton Utilities 95	August 1995	Can save your bacon without scrambling your long file names.
PC Care 95	October 1995	This thorough diagnostic tool isn't for everyone.
QuickView Plus	October 1995	Improved QuickView gives you more file viewers and features, but window management is clumsy.
TabWorks 2.0	August 1995	Binder-and-tab-pages metaphor adds an extra layer of complexity and simplifies nothing.
WinZip 6.0	August 1995	Terrifically useful file compression tool.
ON THE HORIZON		
Arcada Backup 95	September 1995	Not available for preview.
d-Time95	August 1995	Not available for preview.
Dashboard 95	August 1995	Not available for preview.
Hurricane 95	October 1995	Not available for preview.
Remove-It	October 1995	Not available for preview.
UnInstaller 3	September 1995	Not available for preview.
Viewer95	August 1995	Not available for preview.

keeps you from having to upgrade an otherwise satisfactory application.

Norton Navigator also includes SmartFolders that automatically create and store shortcuts according to your criteria (for example, the last 12 Word documents you stored in your Monthly Reports folder). Finally, Norton Navigator includes a File Archive Wizard to help you locate old or out-of-date files so you can retire them to floppies and save hard disk space.

Symantec deserves a resounding scolding for including an installer that gives you no choice over which of Norton Navigator's utilities to install or uninstall—it's all or nothing. Among them all, though, you're bound to find some favorites.

• **The Norton Navigator for Windows 95** street price $99, upgrade from Norton Desktop and Norton Commander for Windows, PC Tools, or XTree $39; Symantec; 800/441-7234, 503/334-6054, 503/334-7474 (fax)

Reader service no. 780

You won't use The Norton Utilities every day, but when trouble strikes, you'll be glad it's close at hand.

The Norton Utilities for Windows 95

The new Norton Utilities helps you with Windows 95 before you even upgrade your operating system: It comes with DOS utilities that clear space on a crowded hard drive, repair common disk problems, and defragment your drive—preparing the way for the big upgrade.

Once you've installed Windows 95 and the new Norton Utilities, you'll eventually make your way to its centerpiece, the Norton System Doctor (not to be confused with the Norton Disk Doctor). This control panel can monitor more than 60 parameters such as disk integrity, fragmentation, CPU usage, and system resources. The panel is highly configurable, letting you choose, for example, which functions to monitor and whether the monitor should appear as a bar gauge, speedometer, or histogram. You can also use this panel as the launch point for any of the package's other Windows utilities. If you prefer, you can launch the individual components as you would any other programs.

To prepare for disaster, you can save a snapshot of your hard drive to assist the unformat or unerase utilities, and you can create a bootable floppy with emergency tools and copies of important system files. There's even an improved Recycle Bin, although its small, fixed-size windows mar its usefulness.

If disaster strikes and you aren't prepared, you can also turn to Norton for a pound of cure. The new Norton Disk Doctor is nearly indistinguishable from previous versions, except that it repairs problems related to long file names. The UnErase Wizard (which you can open from the Norton Recycle Bin) makes the original Norton feature much easier.

Like items in a household toolbox, you won't use many of these programs everyday, but when trouble strikes, you'll be glad The Norton Utilities is close at hand.

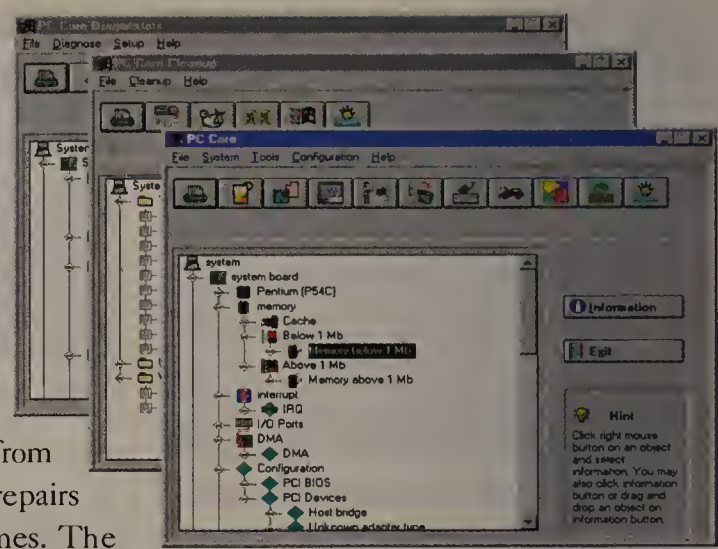
• **The Norton Utilities for Windows 95** street price $119, CD-ROM $129; upgrade from The Norton Utilities, Norton Desktop for Windows, or PC Tools $59; Symantec; 800/441-7234, 503/334-6054, 503/334-7474 (fax)

Reader service no. 781

PC Care 95

PC Care provides system information, hardware diagnostics, uninstall capabilities, software troubleshooting analysis, and hard disk cleanup. But it isn't for everybody, because the user interface—based on a collection of tree diagrams—can be intimidating to the nontechnical user. For folks who know their way around a computer, however, PC Care may prove quite useful.

Once you get used to it, these trees make it easy to get around. For example, the hardware diagnostic tree shows your drives, modem, and processor board, with branches reflecting various functions and tests. To get information about an item, just right-click it. PC Care is truly modular, allowing you to download and add new modules as they become available.



PC Care's windows use tree diagrams to help you navigate your computer's innards.

One of PC Care's more interesting modules troubleshoots applications that won't run by comparing their required settings against your computing environment. There's also a Cleanup module that identifies useless files you can safely delete, such as orphaned file fragments or duplicate files. Well, not really duplicate files. The module only lists duplicate file *names*—hardly a perfect indicator of redundancy.

Like most diagnostic programs, PC Care can be opaque and confusing at first glance, although the well-written online help makes the leap much easier. There's no way to interrupt the longer tasks—PC Care could definitely use a good stop button.

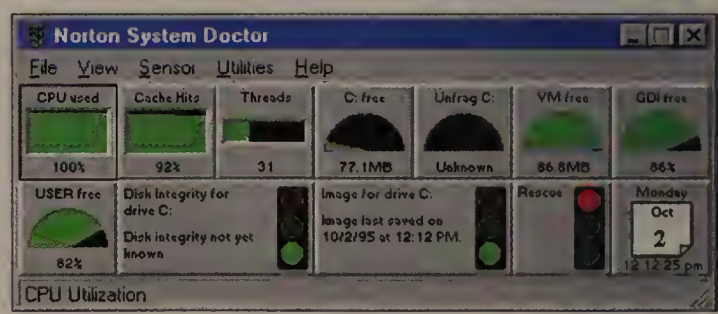
If you're technosavvy enough to understand what all the hexadecimal numbers mean, PC Care could prove very useful.

• **PC Care 95** street price $39.95, upgrade $24.95; American Megatrends; 800/828-9264, 404/246-8790 (fax)

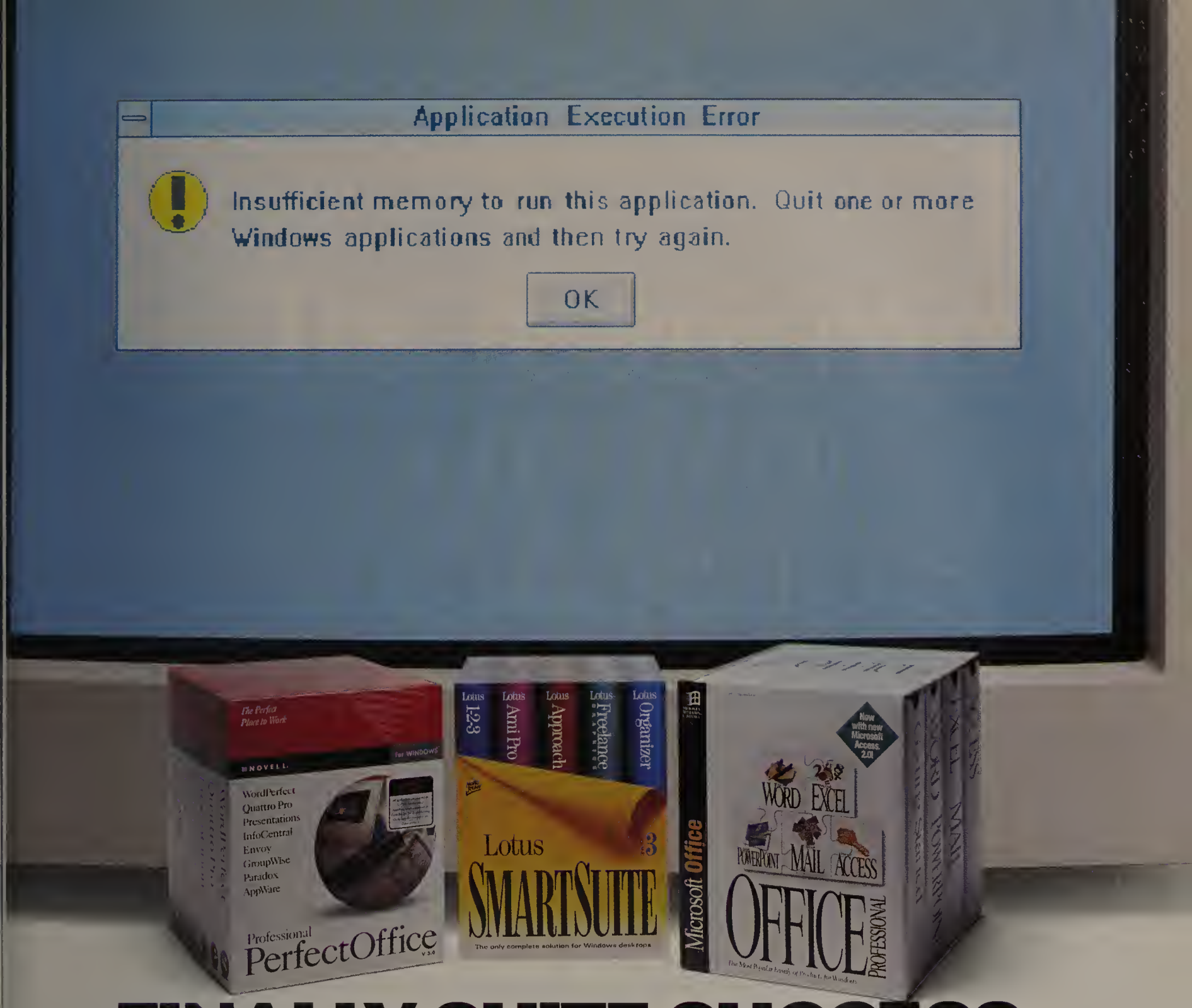
Reader service no. 782

Quick View Plus

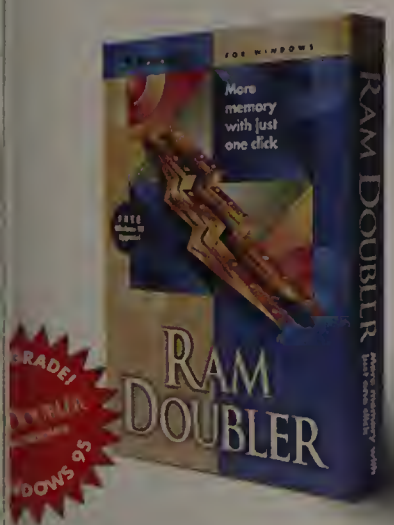
With Quick View, Windows 95 gives us something we always wanted: A way to peek inside files without opening the associ-



The Norton System Doctor acts as the control center for The Norton Utilities' various modules.



FINALLY, SUITE SUCCESS.



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Fixes Memory Below 1MB	✓	✓		
Uses Compression To Double Application Memory Space	✓	✓	✓	✓
Doesn't Modify Autoexec.bat Or Config.sys.	✓			✓

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SYSTEM REQUIREMENTS: A PC equipped with a 386, 486, Pentium or equivalent processor. Windows 3.1 or 3.11, Windows for Workgroups 3.1 or 3.11, running in 386 enhanced mode. 4 MB RAM required, 8 MB RAM recommended. RAM Doubler for Windows works in tandem with any DOS memory extender, such as QEMM or Netroom. © 1995 Connectix Corporation. 2655 Campus Drive, San Mateo, CA 94403 USA. 800-839-3628 • 415-571-5100 • FAX 415-571-5195. RAM Doubler is a trademark of Connectix Corporation. All other trademarks are the property of their respective holders.

ated application. Microsoft licensed Quick View from System Compatibility, maker of the Windows 3.1 file-viewing utility, Outside In. Quick View Plus from Inso Corporation, which bought System Compatibility earlier this year, can be considered an upgrade to both programs.

Unlike the bundled Quick View, which supports only about 30 file formats, Quick View Plus knows more than 200. It can show you the most popular word processor, spreadsheet, database, and graphics file types, but not desktop publishing files.

Quick View Plus is useful not only because of what you can view, but also how you view it. You can see all or most of a file's formatting, plus any OLE objects inside it. An additional menu corresponds to the file type you're viewing, with options like showing or hiding gridlines in a spreadsheet or zooming and rotating for graphics. When you view a .zip file, you can examine the files within it or copy them to disk.

But viewing is only part of the fun. You can search for text in the file you're viewing—a drop-down list even preserves recent search criteria. You can also copy or print all or part of a file.

If you've used Outside In, you'll be both amazed and disappointed by Quick View Plus. Amazed because it completely disappears in Windows 95's user interface, giving you an easier environment than a Windows 3.1 utility could even dream of. And disappointed because some of the old Outside In flaws are still there. For instance, when you decompress a zipped file, the default directory is never the one the .zip file is in.

Window management is as clumsy as in the plain old Quick View. There's no automatic tiling function, and if you're viewing one file and want to view another, you're forced to return to Explorer and either invoke the view command again or drag and drop. I'll stick with Drag and View, a low-cost shareware alternative from Canyon Software (see "Drag and File"), even though it's still a Windows 3.1 program.

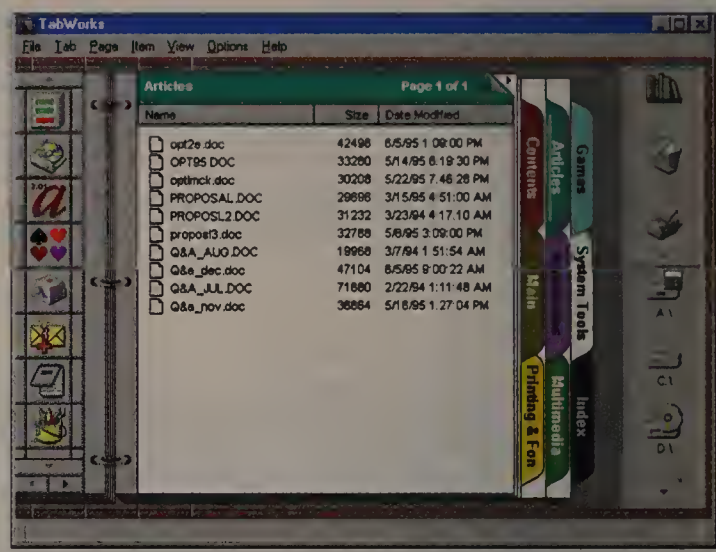
The upshot: If you're not getting what you want with your old viewer or the bundled Quick View, check out Quick View Plus.

• **Quick View Plus** list price under $50; Inso Corp.; 800/333-1395, 312/329-0700

Reader service no. 783

TabWorks 2.0

TabWorks, from Xerox's XSoft division, bills itself as a document management program. What it really is, though, is a dressed-up Program Manager replacement, which is pointless in Windows 95. TabWorks' metaphor—a three-ring binder with tabbed pages for organizing your files and program icons—seems intent on dumbing down Windows. But what's so easy or intuitive about keeping files on the pages of a book? The box includes both Windows 3.1 and Windows 95 versions.



TabWorks's binder-and-page-tabs interface is supposed to makes things easy, but in only adds to your filing chores.

Perhaps realizing that this approach is clumsy, XSoft threw in a toolbar for quick access to programs you use a lot, plus a "holding area" where you can temporarily drop objects—a useful tool if you're not familiar with the Windows 95 desktop.

If you like its metaphor, TabWorks is an okay replacement for Windows 3.1 Program Manager. But in Windows 95, it's a solution to a nonexistent problem. Maybe you think Windows 95 needs more dumbing down; it's hard to get any dumber than this.

• **TabWorks 2.0** list price $49; XSoft; 800/909-4446

Reader service no. 784

TabWorks metaphor wants to dumb down Windows. But what's so easy about keeping files in a book?

When you first install TabWorks, it asks to import your program icons. Once it's done that, and once you've bothered to do a little dropping and dragging on your own to get your important files there, you can deal with pages instead of folders. At least the binder includes an automatically updated table of contents and index to the items stored in the various pages; it would be completely useless without them.

UTILITIES BUNDLED WITH WINDOWS 95
Backup
Disk Defragmenter
Resource Meter
ScanDisk
System Monitor
Net Watcher
Screen Savers
DriveSpace
Accessibility Options
QuickView
WinPopup

WinZip 6.0

WinZip 6.0 makes it easy to deal with the most popular compression formats—.zip, .arj, .lzh, .arc, and others. At first glance, the 32-bit version 6.0 seems just like its predecessors (versions 5.6 for Windows 3.1 and Windows NT): You get the same handy toolbar for creating, opening, viewing, extracting, and temporarily installing the contents of a compressed file; you can add items to a compressed file by dragging and dropping; and you can easily perform basic file management tasks on the archive.

So what's new? When you click the right mouse button to drag and drop compressed files in Explorer or My Computer, the pop-up menu includes an 'Extract to' option that decompresses the dragged file to the new location rather than moving or copying the archive; the WinZip window opens during the extraction process but immediately goes

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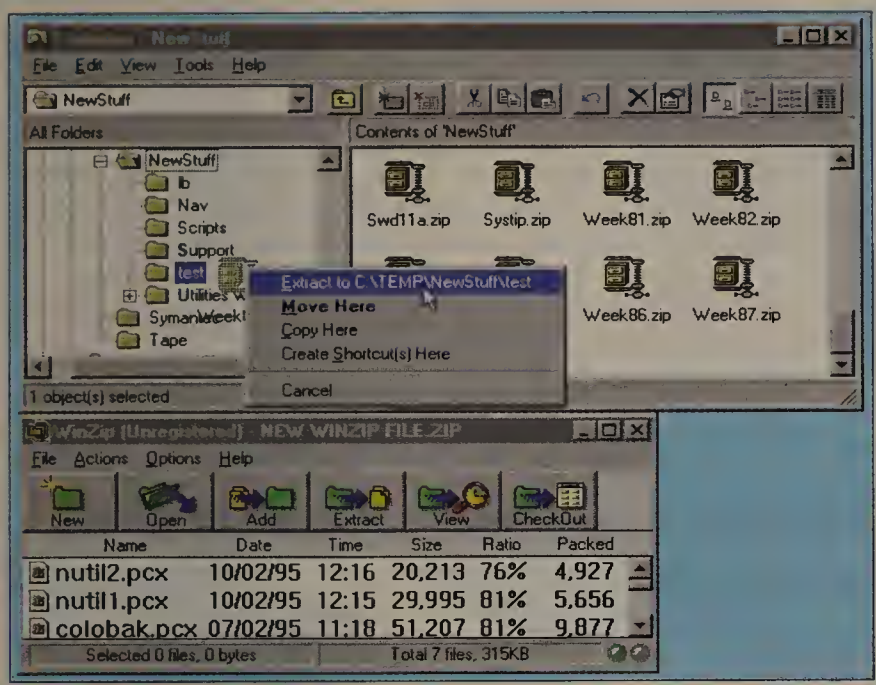


WinZip 6.0 adds zip and unzip functions to the right mouse button.

away when finished. The right mouse button is a handy way to compress files, too: Right-click one or more files, and there's an option for zipping them. You can also create new .zip files from Windows 95's New menu. And WinZip supports long file names with aplomb, even maintaining them as you zip and unzip files.

By the time you read this, the Windows 95 version of WinZip should be available as **winzip95.exe** on PC World Online.

• **WinZip 6.0** registration fee $29 (registered users of earlier versions can download a free upgrade); Nico Mak Computing; 800/242-4775 (credit card orders); ftp: winzip.com/winzip

Reader service no. 785

On the Horizon

A surprising number of utilities were ready for me to look at, but a few missed the boat. And still others were being kept under very tight wraps.

In the clean-up area, expect to see Windows 95 versions of Vertisoft's Remove-It and MicroHelp's UnInstaller. Both will remove 32-bit as well as 16-bit applications, and are handy with Windows 95's registry. To improve performance, there's also a Windows 95 version of Helix's Hurricane in the works. Again, details are not forthcoming.

Starfish Software is readying a Windows 95–specific version of the well-known Dashboard, a floating control panel that centralizes application launching, system monitoring, printing, and other common functions.

I know of at least one competitor to Quick View Plus: Viewer-95 from Mastersoft, which promises a stand-alone user interface plus Explorer integration.

Ballard Synergy's d-Time95 should improve CD-ROM speed by caching the disc drive to your much faster hard drive, where you can create a far larger cache than you could in RAM.

Finally, look for a backup program from Arcada Software called (appropriately) Arcada Backup for Windows 95.

• **Arcada Backup for Windows 95** list price $99; Arcada Software; 800/327-2232, 407/333-7500, 407/333-7730 (fax)

Reader service no. 786

• **d-Time95** list price $89.95; Ballard Synergy; 800/692-0492, 206/656-8070, 206/656-8205 (fax)

Reader service no. 787

• **Dashboard 95** street price $49.95, upgrade $39.95; Starfish Software; 800/765-7839

Reader service no. 788

• **Hurricane for Windows 95** list price $79.95, upgrade free; Helix Software; 800/451-0551, 718/392-3100

Reader service no. 789

• **Remove-It** price not yet available; Vertisoft Systems, Inc.; 800/466-5875, 415/956-5999

Reader service no. 790

• **UnInstaller 3 for Windows 95** list price $79.95, upgrade from 16-bit version free; MicroHelp; 800/777-3322, 770/516-0899, 770/516-1099 (fax)

Reader service no. 791

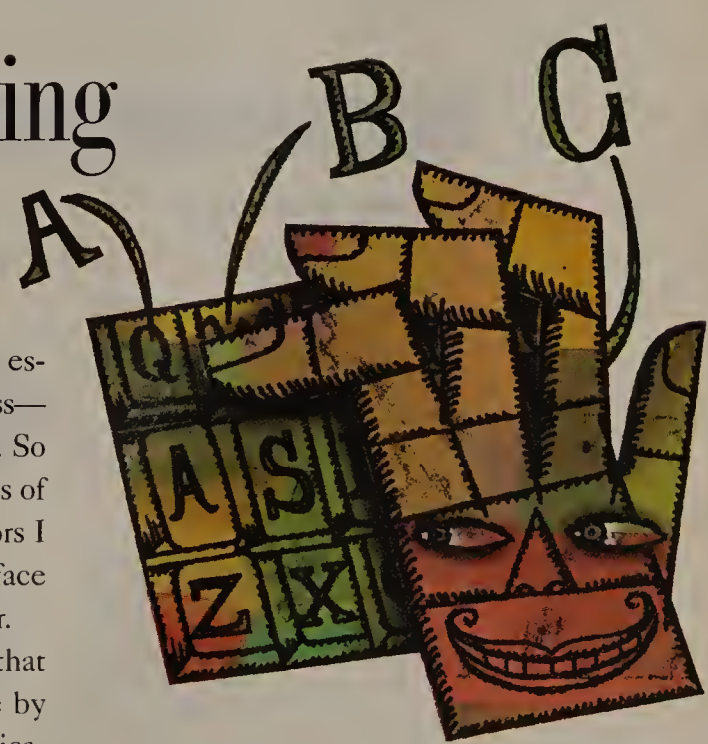
• **Viewer95** list price $79; Mastersoft; 800/624-6107, 602/948-4888, 602/948-8261 (fax)

Reader service no. 792

Word Processing

WAR OF THE WORDS

BY GEORGE CAMPBELL



Let's face it, word processing is essentially a straightforward process—you sit down and do the work. So it's a good thing that the makers of two of the three word processors I looked at put their energies into interface design and tools to make the work easier.

They've also apparently decided that word processing isn't necessarily done by one person, so they've made the applications more workgroup oriented. Then there are those Orwellian touches that watch how you work and try to make it better. While these features might initially give you the heebie-jeebies, they actually save time.

DeScribe 5

DeScribe is a brash little David in a world of Goliaths. The least-known word processor in this group, DeScribe has a loyal following in the OS/2 Warp camp. It's the only product we saw in its final form, and its availability for Windows 3.1, Windows NT, Windows 95, and OS/2 in essentially identical versions—all available on the same $49 CD-ROM—certainly perks up interest, despite DeScribe's tiny share of the market.

Rather than try to beat Microsoft and Lotus at their own game, the maker of DeScribe takes a different approach to word processing—a frame-oriented environment reminiscent of a desktop publishing program. DeScribe's menus are decidedly odd at times—placing, for example, the spelling

Land-based Rocket...

Start

Every so often, technology surges with machines and devices that completely eclipse everything in their class. This is one of those surges. This is the new French bullet train. **Le Train à Grand Vitesse!** At speeds of over **300mph** it's the fastest surface transport on earth! Not just a showpiece, this land-based rocket is a daily workhorse moving business commuters and travelers safely and reliably to their destinations on a national rail network designed for high speed travel.

...Desk-based Rockets

This is another one of those surges. This is the new line of PREMIO® Express, Pentium® chip-based systems. They're designed to take full advantage of the many advances in the Triton PCI chipset. The design stresses speed (amazing speed) through faster memory and wider I/O bandwidth, while adhering to "designed for Windows® 95" system specifications. The result is a desk-based rocket that's stable and reliable on a platform that's designed to link readily with future technologies. You'll be surprised how little it costs to switch to the fast track.

Microsoft Windows 95

TECHNICAL BULLETIN

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Pipelined burst Cache uses synchronous SRAM (instead of the more common asynchronous SRAM) along with an added output register so that write cycles are self-timed and, of course, synchronized with the CPU clock. This cache design allows the current bus cycle to be "in the pipeline" while the data for the next is being accessed.

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intel inside pentium® PROCESSOR

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- Quad speed CD-ROM
- 15" PREMIO Monitor
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- MS DOS6.22 and Windows for Workgroups 3.11 or Windows 95
- Novell's PerfectOffice Suite
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- Free NetCruiser Internet Software

Pentium® chip speed / PC price:		Business Lease:
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100MHz	**$2449.**	$82.78/mo.
90MHz	**$2299.**	$77.71/mo.

Vitesse CADstation

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- 32MB EDO Memory expandable to 128MB
- 1.6GB Enhanced IDE PIO Mode 4 Hard Disk
- #9 128-bit PCI video w/4MB VRAM
- 14.4 Data/FAX/Modem
- Quad speed CD-ROM
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- MS DOS 6.22 and Windows for Workgroups 3.11 or Windows 95
- Free NetCruiser Internet Software

Pentium chip speed / PC price:		Business Lease:
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100MHz	**$5749.**	$194.32/mo.

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- Quad speed SCSI-2 CD-ROM
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Same as Express Station above with the following additions and exclusions:

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- 14.4 Dat/FAX/Modem
- 16-bit sound card
- 2 Stereo speakers
- Grolier's Encyclopedia, Compuserve, World Atlas, Strike Commander, Kings Quest VI, Everywhere USA, Mario, Mario is Missing, Wing commander

*Optional Novell PerfectOffice Suite

Pentium chip speed / PC price:		Business Lease:
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120MHz	**$2599.**	$88.18/mo.
100MHz	**$2399.**	$81.42/mo.
90MHz	**$2259.**	$76.35/mo.

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Monitor Upgrade Options:
From 14" to 15" add ..... $130.
From 15" to 17" add ..... $350.
From15" to 21" (.25 dot pitch) add ..... $1499.

Networking
NOVELL Netware 4.1 (5 users) ..... $495.
3COM 3C590 Combo EtherLink III
PCI Bus Master adapter ..... $149.
3COM 3C595 Fast EtherLink
PCI 10/100 Ethernet adapter ..... $169.
ZNYX PCI 4-Channel 10BT Ethernet,
on board PCI-Bridge ..... $399.

Software
Windows NT (Workstation) CD ..... $249.
Novell PerfectOffice Suite (w/system only) .... $99.

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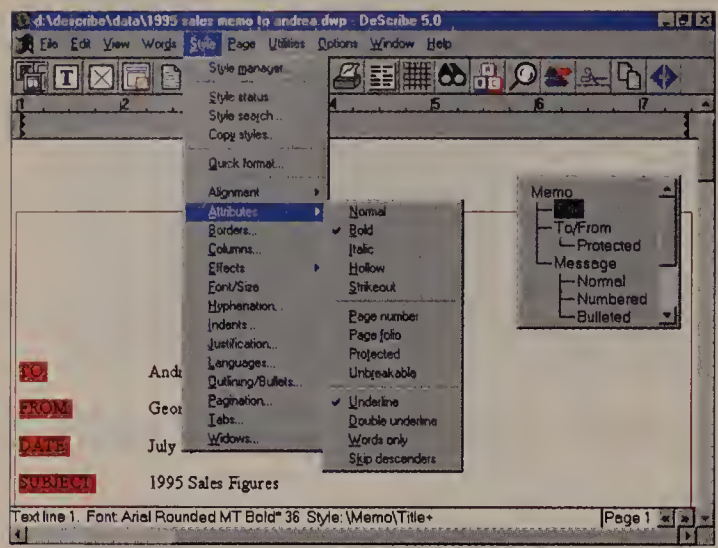

DeScribe's extensive menus make formatting text a more difficult chore than it need be.

checker under a menu item called simply Words. It uses separate dialog boxes for almost every function, a more awkward and ultimately more time-consuming approach than the all-in-one dialog boxes seen in other programs. Version 5 does add some features that were previously missing, including footnotes and endnotes, unlimited undos, and a capable macro language.

Unique to DeScribe is its ability to link multiple frames—containers in which you can place text, graphics, or any other insertable object—allowing text to flow from one frame to another. Creating a newsletter in this environment is a snap, since text can automatically jump from frames on one page to frames on another. I found that other layout features unique to DeScribe, such as booklet-printing and crop-marking tools, further expand the program's usefulness as a document processor rather than a mere word processor.

Thanks to its OS/2 heritage, DeScribe makes good use of multithreading; in version 5, ordinarily time-consuming tasks such as printing, spell-checking, mail merges, and file import and export now operate in the background while you continue to work. It's also adept at staying out of the way of other applications running in the background. While printing a long document, I could easily call up Microsoft Network and send messages, for example. DeScribe's multithreaded, automatic, and almost continual backups proceed virtually unnoticed.

DeScribe lacks OLE 2.0 support, limiting the program's interactions with other Windows 95 applications. Moreover, the lack of extensive usability features—such as WinWord's wizards and natural-language help ('How do I change line spacing?')—make the program more difficult to learn than a word processor ought to be, especially for novices.

While DeScribe is still a pretty good little word processor, few users of the Big Three —Microsoft Word, WordPerfect, and Word Pro 96—are likely to switch to it.

• **DeScribe 5** list price depending on number of users and level of technical support $49 to $6995; DeScribe, Inc.; 813/732-5500, 813/732-5414 (fax)

Reader service no. 793

In DeScribe, time-consuming tasks such as printing and mail merges now operate in the background.

Microsoft Word for Windows 95

Always a big gun in word processor shootouts, Word for Windows 95 packs plenty of usability ammunition for Windows 95. Typical of the flashier shotgun features is Spell It. As you type, WinWord marks misspelled words with a wavy redd underline when you press the <Space> bar. Right-click the offending word (immediately or later), and alternative spellings pop up in a menu for instant insertion—without slowing your typing.

Word for Windows 95 also seems to act like a mind reader with its behind-the-scenes formatting magic. For example, type an asterisk or a number followed by a period at the beginning of a line, and WinWord sets up a bulleted or numbered list for you automatically. Naturally, you can turn off these Big Brother features, but once you've used them, you probably won't want to.

Even basic dialog boxes have been spruced up. *File•Open*, for example, now includes a multithreaded Find function. Enter a file specification or text to locate in a document file, click *Find Now*, and WinWord will hunt down matching files and let you preview them in a thumbnail window. This is far better than version 6.0's clunky Find File command.

The addition of an address book to Word for Windows 95 is particularly handy, because it's linked to Microsoft Exchange and the company's Schedule+ 2.0 personal information manager. The address book offers tabbed pages for correspondence, E-mail, and phone information. You can use it to insert addresses into documents, to route E-mail, to send faxes, and to do mail merges.

While Microsoft Word's wizards were always friendly, the new Answer Wizard is downright chatty, letting you pose questions in everyday English ('How do I set up three-column documents?'), while the Tip Wizard uncannily watches you work and suggests better ways to do frequently performed tasks—again, a tad Orwellian.

Group editing features are about the same as WinWord 6.0's, with color marking by author and a floating dialog box for reviews, but they're not particularly easy to set up and maintain. Multithreading in the printing

WORD PROCESSING AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
DeScribe 5	August 1995	Bargain price, but confusing interface and no OLE 2.0 support.
Microsoft Word 95	August 1995	Productivity-boosting improvements in ease of use are main hallmark.
Word Pro 96	fall 1995	Major workgroup improvements are also found in the 16-bit Windows 3.*x* version.
ON THE HORIZON		
WordPerfect 95	late 1995	Not available for preview.

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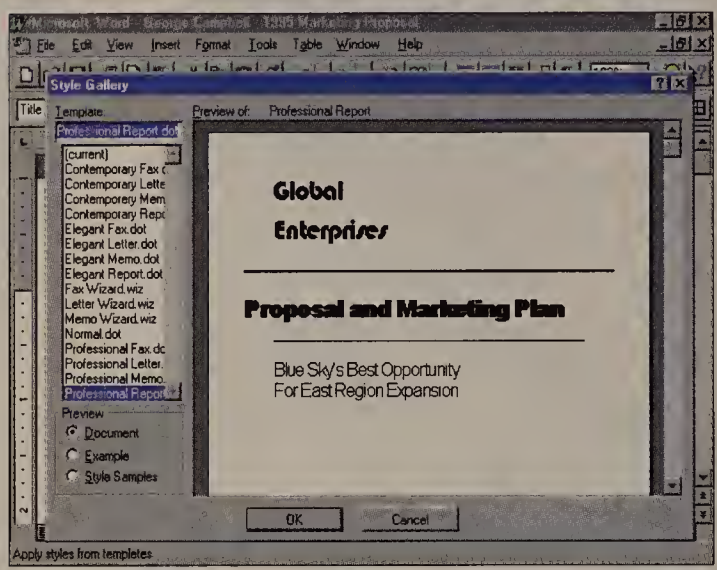
and file-opening processes gets you back to work quickly during long operations.

Working with other applications simultaneously also seems much snappier than in WinWord 6.0, due to Windows 95's better resource sharing. For example, using OLE 2.0 to insert and edit an Excel worksheet object in a document doesn't slow things down nearly as much as it did in the Windows 3.1 version, and you don't have to worry about resources running out and bringing your entire project to a halt. Also, WinWord makes use of Office's Binder (see "Suites and Integrated Packages").



Word for Windows' style gallery feature makes it easy to turn raw text into a well-formatted document.

Overall, these improvements in the program just make Word for Windows 95 *feel* easier to use. Current WinWord users with at least 8MB of RAM will no doubt adopt this new version quickly.

• **Microsoft Word for Windows 95** street price $339, upgrade $109; Microsoft; 800/426-9400

Reader service no. 794

Word Pro 96 Edition for Windows 95

As Lotus Development's replacement for Ami Pro 3.1, Word Pro 96 offers exceptional new features—particularly for workgroups. But it also makes for some confusion about which version users should buy. That's because the features in the 16-bit Windows 3.*x* package are the same as those in the 32-bit versions for Windows 95 and OS/2 Warp.

Since the features are identical across platforms, there may be little reason to move to the Windows 95 version. Well, little reason beyond the ability to use long file names—which may be reason enough—and the program's still-theoretical greater operating stability and increased speed.

Nevertheless, upgrading from Ami Pro to Word Pro brings some tangible advantages, whatever platform you choose. This is especially true in workgroup environments. Setting up and maintaining documents for workgroups has never been easier. With Word Pro, you can pick the users, assign access security, and set up options such as editing colors for each user—all in one tabbed dialog box. Routing, reviewing edits, and creating a final document are almost automatic. Since all edits are stored in the same Word Pro document, no network is required, although network broadcasting is available. A review toolbar displays the editor's name and offers buttons for finding, accepting, and rejecting edits.

Word Pro also gets an overhauled user interface. Whether you're editing text, a frame, or a table, you see just the tools and menus you need. Right-click any element in a document to get a more focused, context-sensitive pop-up menu. And the new floating Properties dialog box gives instant access to all formatting functions for whatever object you're working on. Besides its convenience, this dialog box's tabbed approach speeds up formatting by putting related functions on separate pages. The Properties box, like the menus, changes depending on what you've selected. This is a godsend, especially if you deal with heavily formatted documents.

Like WinWord, Word Pro now offers an as-you-type spelling checker, although a large toolbar keeps this feature from being as slick as WinWord's clean screen.

Styles, always an Ami Pro hallmark, have been enhanced in Word Pro. In addition to the old text styles, you can now create and use styles for characters, frames, and tables. Formatting a table, for example, is as quick as selecting a style from a pull-up list on the status bar. The new version's nested document architecture lets you put any object inside any other object, making it easy to add a graphic or even an entire table directly to an existing table cell. Like WinWord, Word Pro offers built-in Internet HTML, but you don't get a World Wide Web browser.

In most cases, on-screen dialog boxes and toolbar-like dialog substitutes work in tandem with the active editing screen, letting you keep working while the dialog box remains on screen. Ami Pro's clumsy old search-and-replace tools have been superseded by a toolbar with a complete set of options. As in Word for Windows 95, scrolling no longer jumps out of hand between pages, and Word Pro offers unlimited views of a document, including fully editable thumbnails—a particularly valuable feature when working with complex projects. Following Word for Windows' lead, the Ask the Expert function answers 'How do I' help requests. Finally, users are liberated from having to give every document a .sam extension.

Although Word Pro 96 nicely adopts the Windows 95 look and feel, and although users can drag and drop between applications as well as create long file names, this Lotus package doesn't take advantage of Windows 95's multithreading capabilities. Still, for users in a workgroup environment, Word Pro's excellent team-editing capabilities make this program a serious contender.

Upgrading from Ami Pro to Word Pro brings tangible advantages, especially in workgroup environments.

• **Word Pro 96 Edition for Windows 95** list price $105; Lotus Development; 800/343-5414

Reader service no. 795

On the Horizon

At the time of this writing, WordPerfect for Windows 95 was unavailable, even in a beta version. Novell expects this release to ship by the end of 1995 and says it will be identical—feature for feature—to the current Windows 3.*x* version of WordPerfect 6.1.

• **WordPerfect for Windows 95** price not yet available; Novell; 800/451-5151, 801/225-5000

Reader service no. 796

Spreadsheets

A TOTAL OF ONE

BY RICHARD SCOVILLE

What does Windows 95 offer spreadsheet users that it doesn't offer everyone else? It's too early to tell. For starters, the new version of Microsoft Excel was the only Windows 95 spreadsheet available for preview in time for this article, and it hasn't undergone much of a redesign. It still doesn't use multithreading, for example, and boasts no major new analytical features. But it's not a total loss. Microsoft Excel 7.0 for Windows 95 does offer spreadsheet-database integration, some nice interface tweaks, extensions of existing features, and a serviceable mapping add-in.

Most of Excel's improvements occur at the click-and-press level. A little indicator shows what row you're on as you use the scroll bars to move around, and a box on the status line displays the sum, count, or average of any selected range. To display a cell note, simply hover your mouse pointer over the cell.

Even better are some gizmos that ease everybody's least favorite chore: Entering data. As you type a label into a cell, Excel scans the column and pops up the first matching value it finds. You can also click the right mouse button and select an entry from a list of that column's unique values.

Maps! 1-2-3 release 5.0 had 'em, so Excel's gotta have 'em, too. And it's got good ones. Developed with MapInfo Corporation, Excel's mapper is an OLE server add-in that displays your data geographically. To create a map, just select a range of data that includes geographic labels like 'NC' and 'OR', and then click the Map tool. One recurring irritation: The mapper is very picky about names, so if your labels mention, for example, 'Britain' instead of 'United Kingdom', it may refuse to plot your data.

Templates and Databases

Excel will ship with a set of templates for creating invoices, purchase orders, loan managers, and other standard worksheets. You'll be able to link a template to an external database file, easily updating your database with information you enter in Excel.

Microsoft is promising some interesting features that I wasn't able to test fully with my beta copy. For one, the new Excel allows two or more users to add data to the same worksheet simultaneously and helps resolve the inconsistencies bound to arise from this. It also offers close integration with Access: You can use Access forms to edit Excel data and create reports with Access's Report Wizard. The Convert to Access Wizard lets you move a bulging spreadsheet database into Access permanently. Excel supports the Microsoft Office Binder.

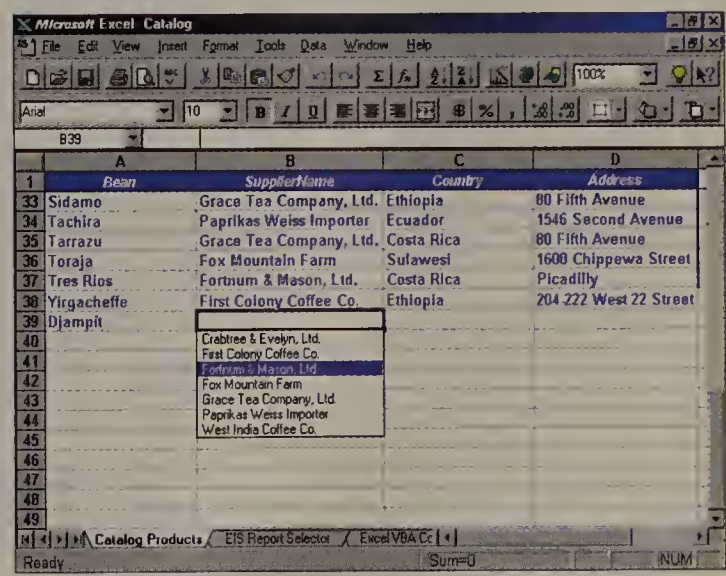
If you need database integration, mapping, or shared worksheets, upgrading to Excel for Windows 95 is a must. Otherwise, it has only the Windows 95 and Office 95–inherent features (long file names, 32-bit performance, the binder, and so on) to recommend it over previous versions.

• **Microsoft Excel 7.0 for Windows 95** list price $339; upgrade $109 through 12/31/95, $129 thereafter; Microsoft; 800/426-9400

Reader service no. 797

On the Horizon

As I write this, Windows 95 spreadsheets from Novell and Lotus remain mere blips on the radar screen. I've managed a peek at a prebeta version of 1-2-3 release 6, which will offer outlines and Approach-style Info Boxes for changing the properties of a worksheet. It's still too early to report on Novell's Quattro Pro, although the company promises increased focus on usability issues.



Excel and your right-mouse button make data entry easy, with a pick list of the current column's unique values.

• **1-2-3 release 6** price not yet available; Lotus Development; 800/343-5414

Reader service no. 798

• **Quattro Pro** price not yet available; Novell; 800/451-5151

Reader service no. 799

SPREADSHEETS AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
Microsoft Excel 7.0	September 1995	Some nice interface tweaks and a mapping add-in, but not many compelling reasons to upgrade.
ON THE HORIZON		
1-2-3 release 6	late 1995	Not available for preview.
Novell Quattro Pro	December 1995	Not available for preview.

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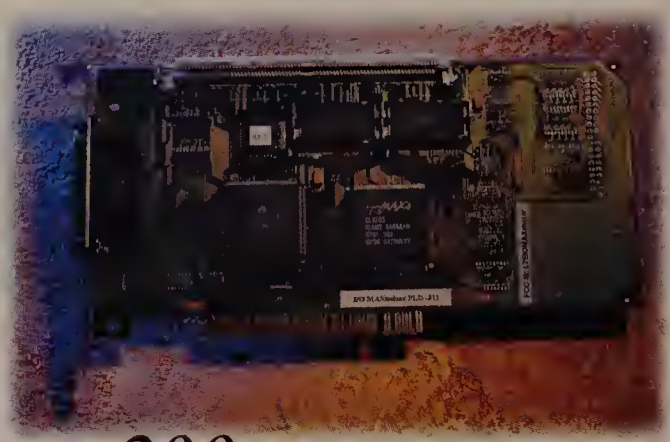
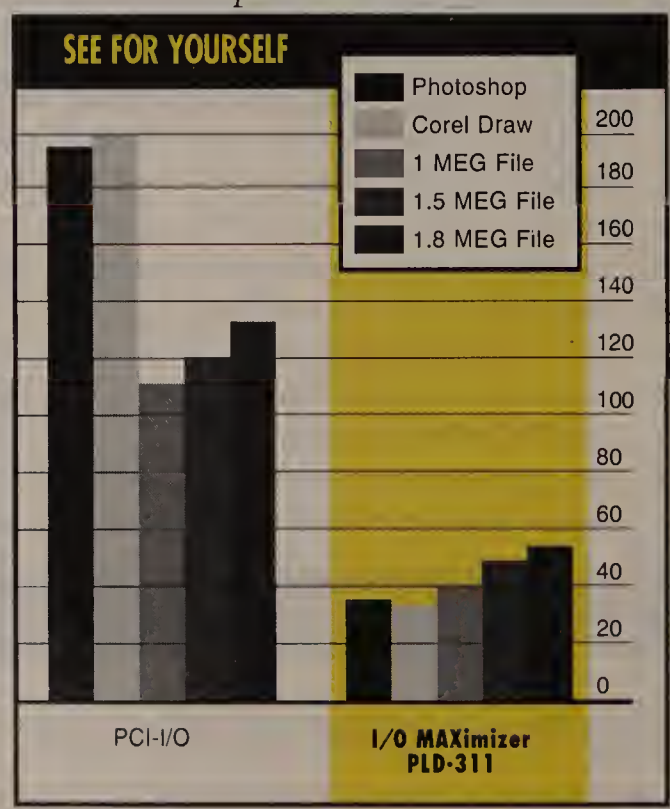


A 300% decrease in wait time was measured using the same test environment as per the chart below.*



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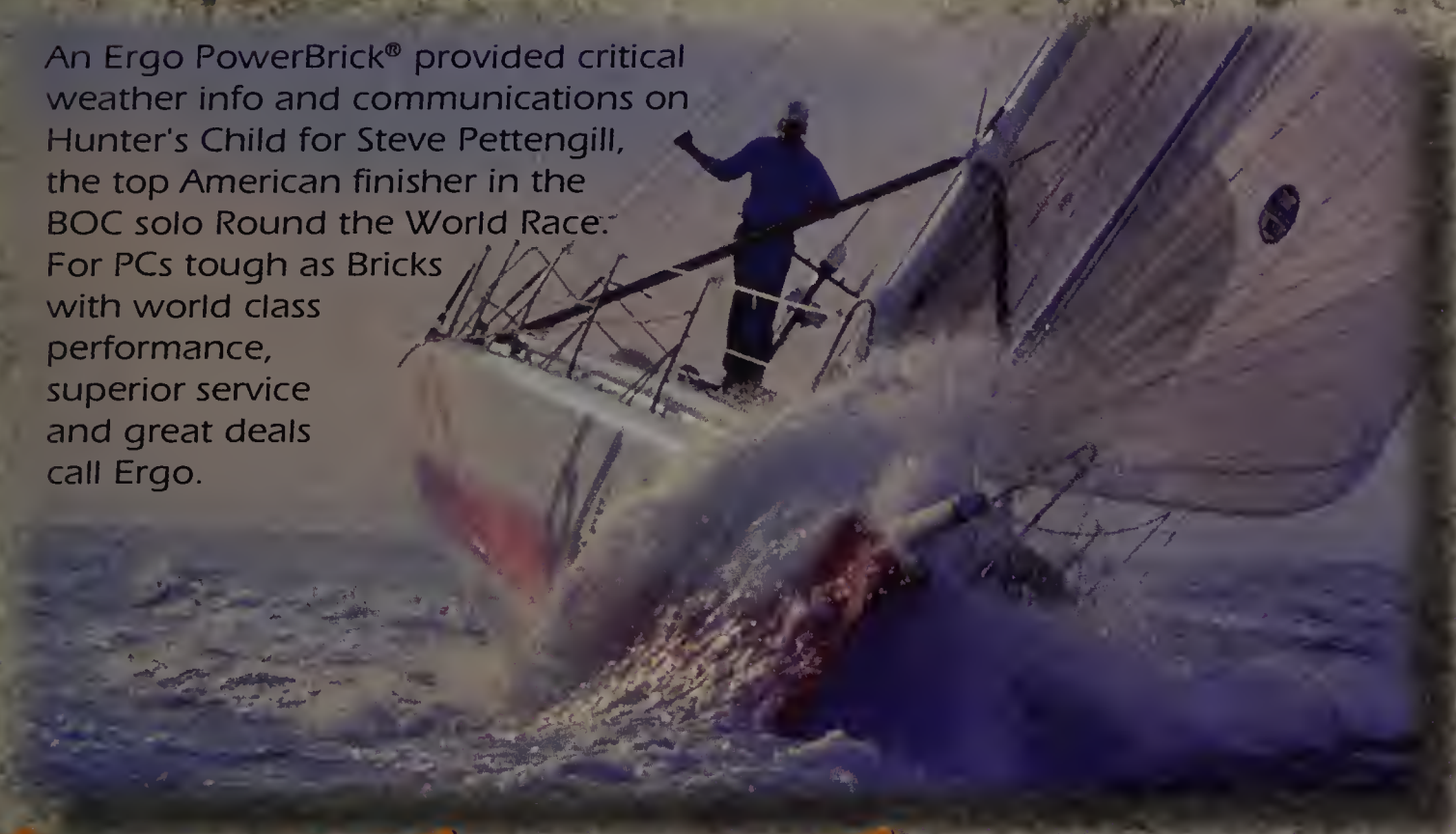

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Circle 95 on reader service card

Personal Information Managers

MAKING A DATE

BY PETER SCISCO

So many meetings, so little time. The world of personal information managers, a category that includes everything from corporate-oriented workgroup schedulers to personal organizers—keeps spinning as Windows 95 rises above the horizon. But from what I've seen—only Janna Contact 95 and Microsoft Schedule+ for Windows 95 were available for preview—there's not much new under the sun, aside from some new looks, OLE integration, and better usability features (good changes in themselves).

Janna Contact 95

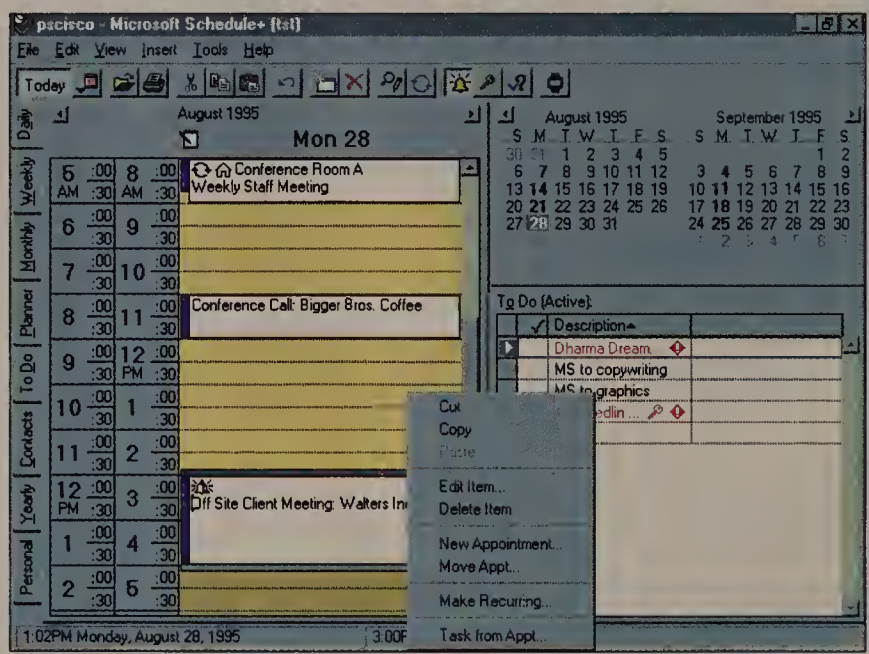
We might not be any closer to a paperless office, but we sure are better at organizing all that paper and moving it around. Like its 16-bit version, Janna Contact 95 offers a contact-and-content–centered approach to help you manage all the information that rolls across your desk, whether it's faxes, E-mail, documents, or phone calls. (Janna Contact has been marketed mostly in Canada until this year; it is now making a major push into the U.S.)

Thanks to full OLE 2.0 support, Janna Contact 95 offers impressive drag-and-drop capabilities and in-place document editing. You can put just about any kind of document—perhaps a letter from Word or a chart done in Excel—into Janna, letting you link all sorts of information to a contact's name. Then you can store it all in the Information Log, which looks much like Windows 95's Explorer.

Janna Contact 95 is no slouch when it comes to scheduling. It seeks out all attendee schedules and suggests a suitable time for a meeting. Surprisingly, this works only with Microsoft messaging systems.

According to Janna Systems, Contact 95 integrates with Microsoft Office 95, which may prove particularly useful. It even works in harmony with Schedule+ on a LAN, so you can use Janna even if others in your office use the Microsoft scheduler.

Janna offers one fun extra: video alarms. Instead of emitting a beep or playing a .wav file, the program can employ an .avi clip to remind you to get going. This might be the place to use a clip of an apoplectic Sergeant Carter from those old "Gomer Pyle" tapes you've been hoarding.



A right-click of the mouse works its magic throughout Schedule+ for Windows 95, making tasks easier.

Janna Contact 95's document-linking features make it a more powerful PIM than Microsoft Schedule+. And its solid links to critical programs like Microsoft Office and Delrina WinFax Pro should make it an ideal addition to your Windows 95 desktop.

• **Janna Contact 95** street price $99, upgrade free to Janna Contact 2.0 purchasers, $49 otherwise; Janna Systems; 800/268-6107, 800/282-0478 (fax)

Reader service no. 802

Microsoft Schedule+ for Windows 95

For the first time, Microsoft's Office application suite will include a PIM, a new 32-bit version of Microsoft Schedule+. The latest version maintains the day-planner look of its predecessors but boasts a new set of contact management tools.

There's also a new level of customization. For example, when viewing your schedule you can simply drag out the view that suits you best, includ-

PIMS AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
Janna Contact 95	August 1995	Excellent document and contact management; integrates with Microsoft Office 95.
Microsoft Schedule+	August 1995	Strong group scheduling and new contact management tools.
ON THE HORIZON		
GoldMine	September 1995	Not available for preview.
Now Up-to-Date	October 1995	Not available for preview.
Sidekick 95	August 1995	Not available for preview.

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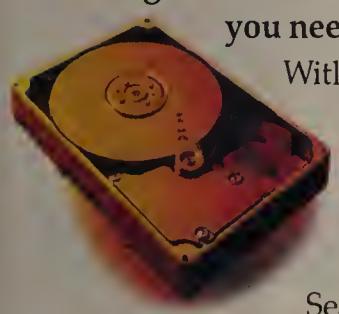

With the big splash being made about Windows 95, don't forget one important thing. When you upgrade, make sure you and your PC don't get swamped. Step up to a big, fast Seagate disc drive now.

The fact is that Windows 95 takes up 60% more disc space than Windows 3.1*. And you can bet that all your favorite applications rewritten for Windows 95 will also be bigger, to say nothing of the files you will create. But with a new Seagate drive, you're guaranteed to have all the capacity and performance you need to soak up all that this 32-bit, multi-tasking operating system demands.

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*Source: PC Magazine, May 16, 1995
**WinBench '95, version 1.0, Disk WinMark result on representative PC platforms.
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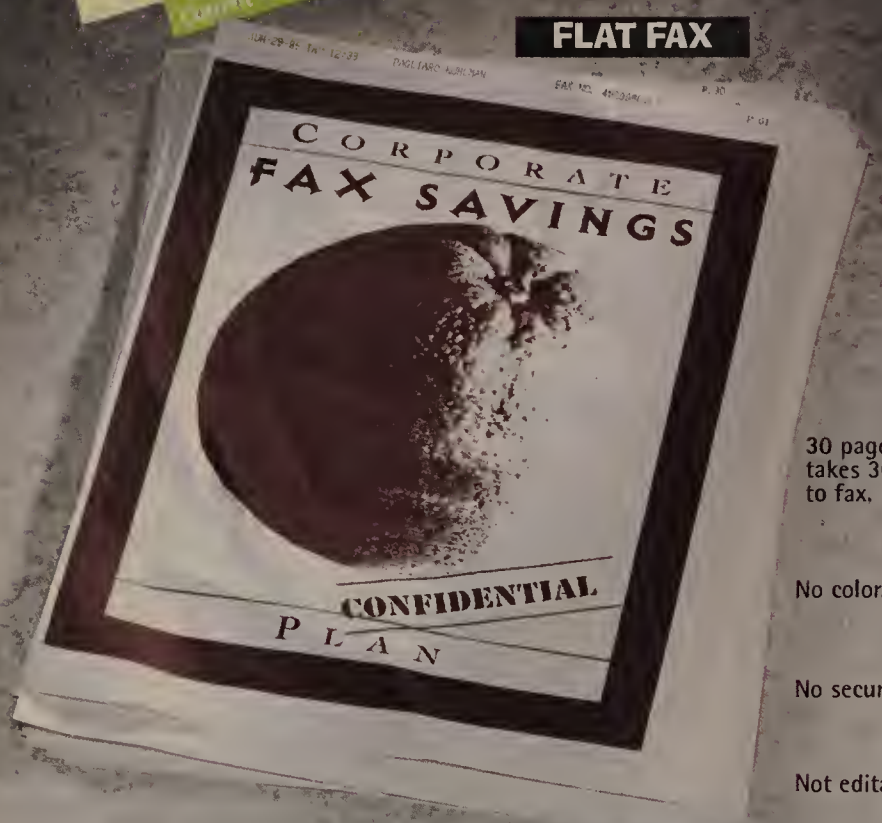

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ing multiple days, weeks, or months. You can add contacts and to-do items to the screen. To-do items can be filtered by priority, say, so you can list completed tasks for a month-end report.

Not all of Schedule+'s new features are particularly useful. One of the new wizards provides advice from Stephen Covey's business book, *The Seven Habits of Highly Effective People*, which is supposed to help you develop a time management philosophy. New-age psychobabble at your fingertips.

Schedule+'s contact manager is probably the best reason for an individual user to upgrade. It's a good place to store client information and phone numbers, with Telephony Application Programming Interface support for autodialing. But while you can keep notes on phone calls, you can't attach documents to specific contact names or appointments—a popular feature in other PIMs.

Within a workgroup setting, Schedule+ boasts sophisticated scheduling and file sharing capabilities, although current users will be justifiably miffed that it won't share information with the Windows for Workgroups version. The program lets you grant permission levels to specific users and mark items as private. So an executive assistant, for example, can update the boss's schedule without having access to personal to-do lists.

By using the Meeting Wizard, you can ask Schedule+ to check coworkers' schedules, then suggest a time for the meeting, taking into consideration such factors as travel time and available resources (like conference rooms and AV equipment). Names of attendees must come from one of Microsoft's messaging systems, such as Microsoft Mail or—when it arrives later this year—the Microsoft Exchange Server.

• **Microsoft Schedule+ for Windows 95** street price $99.95, upgrade $79.95; Microsoft; 800/426-9400

Reader service no. 803

On the Horizon

According to Starfish Software, Sidekick 95 will boast new extras including a small word processor, an expense report maker, and a map of world time zones. It's due out when Windows 95 ships. Now Software's Up-to-Date wasn't quite up to date for this article, but this popular Macintosh PIM will soon ship in Windows 3.1 and Windows 95 editions. GoldMine, a highly customizable workgroup PIM, will ship in a 32-bit version by September, says maker Elan Software. The program will have an improved interface, with tabs and wizards, a report writer, links to Windows 95 accessories, and enhanced group scheduling.

There are some important PIMs that I couldn't even get information on in time for this article. Lotus, for instance, couldn't tell me anything about its Organizer—and the makers of Ecco Professional and Act could not tell me about their updates, either. I'd be surprised, however, if NetManage and Symantec don't check in with 32-bit versions of their products in 1996.

• **GoldMine for Windows 95** street price $221, upgrade price not yet available; Elan Software; 800/654-3526, 310/454-6800

Reader service no. 804

• **Now Up-to-Date for Windows 95** street price $99, upgrade $40; Now Software; 800/722-5963, 503/274-2800

Reader service no. 805

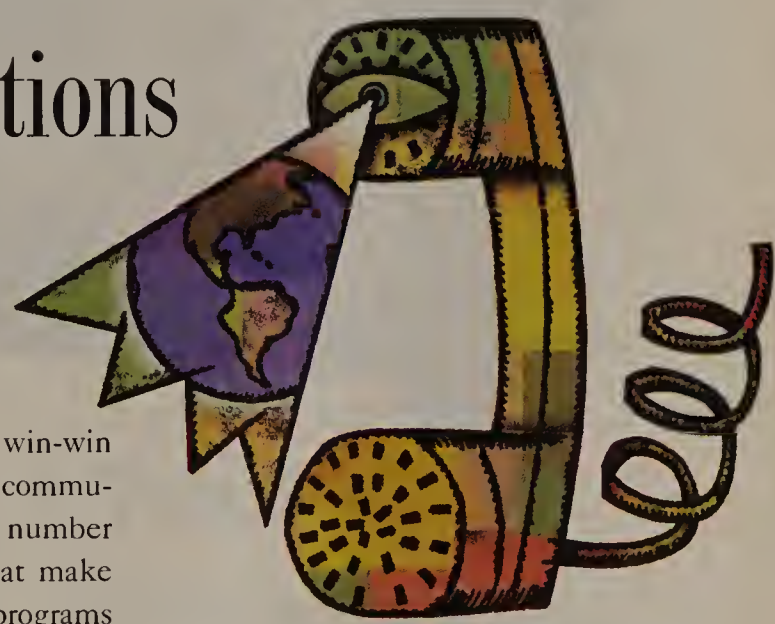
• **Sidekick 95** street price $49.95, upgrade $39.95; Starfish Software; 800/765-7839

Reader service no. 806

Communications

WITH AND WITHOUT THE NET

BY JUDY HEIM



Windows 95 is a win-win proposition for PC communicators. It sports a number of new features that make communications programs more stable and easier to use. It also comes with its own suite of communications tools, some of which are good enough to make third-party products unnecessary—which means those applications will have to be that much better.

Luckily, Windows 95 has many communications-friendly features to help make those programs better. One is TAPI, which serves as a common mediator between the various communications apps and your modem. There's also the Microsoft Exchange, a universal—but not necessarily easy to use—E-mail front end that may eventually handle all your incoming and outgoing messages, wherever they come from.

But even as third-party communications apps take advantage of these new features, they must compete with Windows 95's built-in tools. These include the more than adequate HyperTerminal, a full-fledged 32-bit program based on Hilgraeve's wonderful

COMMUNICATIONS AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
Netscape Navigator	August 1995	Enhanced speed; URLs can be OLE objects—reason enough to upgrade to Windows 95.
Qmodem Pro	August 1995	Fast file transfers and some good features, but most will be satisfied without it.
ON THE HORIZON		
CommSuite 95	October 1995	Not available for preview.
Mosaic In A Box	August 1995	Not available for preview.

It Doesn't Make Sense to Protect Your Front Door...

If Your Back Door is Left Wide Open!

With Windows 95, it will be easier than ever to access on-line services, especially the Internet. You need to prepare for new threats from the viruses that are out there, as well as new types of viruses designed for Windows 95.

In addition, did you know that more than 85% of the 6000 current file viruses are still active in Windows 95? Yet Windows 95 doesn't include even a basic virus scanner, and your old virus software simply won't work!

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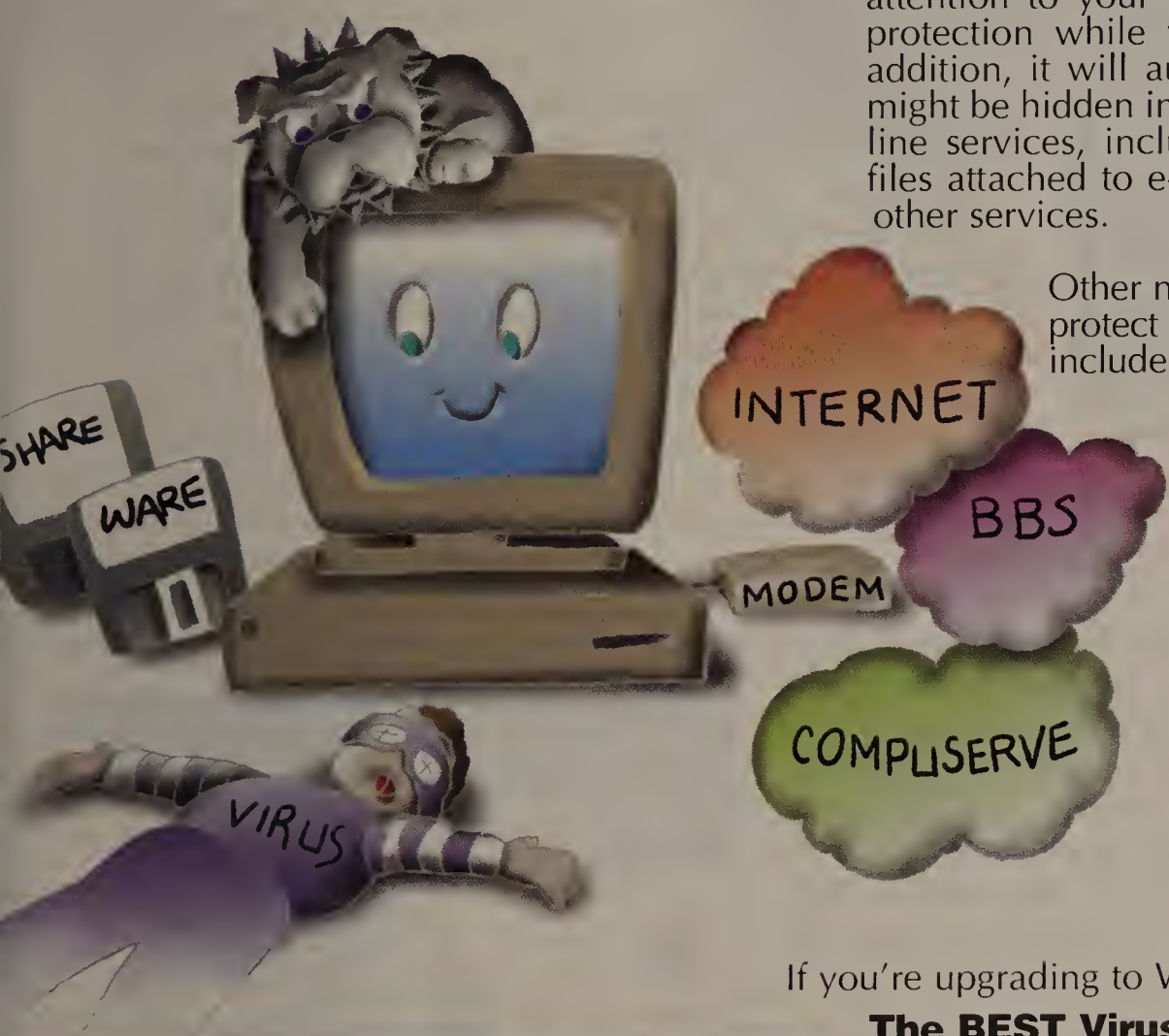

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PC-cillin'95 is the first anti-virus program that pays attention to your modem and increases your virus protection while you access on-line services. In addition, it will automatically scan for viruses that might be hidden in the special formats used with on-line services, including the World Wide Web and files attached to e-mail sent through the Internet or other services.

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Check Internet e-mail	YES	NO	NO
Protect Shared Folder	YES	NO	NO
Watch MODEM Activity	YES	NO	NO
Create "Cleaner" for New Virus	YES	NO	NO

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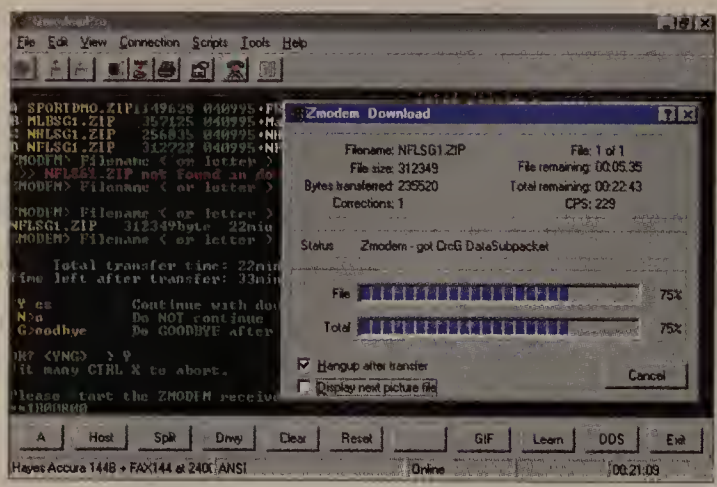
Circle 239 on reader service card

HyperAccess, the bare-bones Microsoft Fax, and a TCP/IP stack for connecting to the Internet through a dial-up SLIP or PPP connection. (You'll still need a service provider and Internet tools such as a World Wide Web browser or mail reader.)

Despite this collection of communications tools, third-party vendors aren't shying away from plans to produce Windows 95 applications of their own. Unfortunately, most companies are taking the slow route in developing these products: At press time, only two—Netscape Navigator and Qmodem Pro—were available in beta form.



Behind the Windows 95 facade lies the terminal window of the old Qmodem we've grown to love.

Netscape Navigator 1.2

Netscape Navigator keeps at the front of the Web browser pack by releasing new betas almost continuously. The Windows 95 beta, version 1.2, is nearly identical to Netscape Navigator for Windows 3.1, but with some nice Windows 95–style improvements to the user interface and—if I'm permitted to judge this from a beta copy—some big enhancements in speed.

The performance difference is the real story. Without getting out my stopwatch, I could easily tell that the new beta release outperforms the Windows 3.1 version—probably thanks to its use of Windows 95's multithreading. Not only could I access multiple Web pages without slowing Navigator to a crawl, but I could also use other applications while doing so.

The interface has improved as well. The bookmark list is now presented as a Windows 95–style outline with icons for your favorite pages. You can add and rearrange links just by dragging and dropping. And the new Preferences tabbed dialog box makes it easier to set up your preferences.

While these enhancements and the other cosmetic changes are nice, performance is what makes this program special. For hardcore Web cruisers, this speedier version of Netscape Navigator is reason enough to trash Windows 3.1 and upgrade to Windows 95.

• **Netscape Navigator 1.2** list price $39; Netscape Communications Corp.; 415/528-2555; http://home.netscape.com/

Reader service no. 807

Qmodem Pro for Windows 95

What do BBS jockeys want in the age of the Internet and Windows 95? Mustang Software has addressed this profound question with Qmodem Pro.

One answer is Internet tools. There's a tool to tap into BBSs over the Internet, thereby avoiding long-distance phone charges. You can even store BBS Internet addresses in Qmodem's dialing directory and download files from the sites via the fast Zmodem protocol.

Some new touches are specific to Win 95. You can drag and drop files into Qmodem to send them off over the wires—although it would be nice if Mustang had bothered to go the other way, letting you drag and drop online files onto your desktop. You can, however, highlight text and drag it from Qmodem's terminal screen onto the desktop or into other applications. Dialing directory entries are now drag-and-drop compliant OLE objects as well. Best of all, Qmodem Pro really knows how to multitask. You can work with other programs while you download without slowing down the transfer. As you download images, they appear on your screen.

Unfortunately, none of these improvements are enough to make Qmodem Pro persuasively superior to Windows 95's own HyperTerminal for most users. If you already use Qmodem, by all means upgrade. Otherwise, stick to Windows 95's own communications tools or wait for your favorite package to come out in 32-bit form.

• **Qmodem Pro for Windows 95** list price $129, upgrade $69; Mustang Software; 800/999-9619, 805/873-2500, 805/873-2599 (fax)

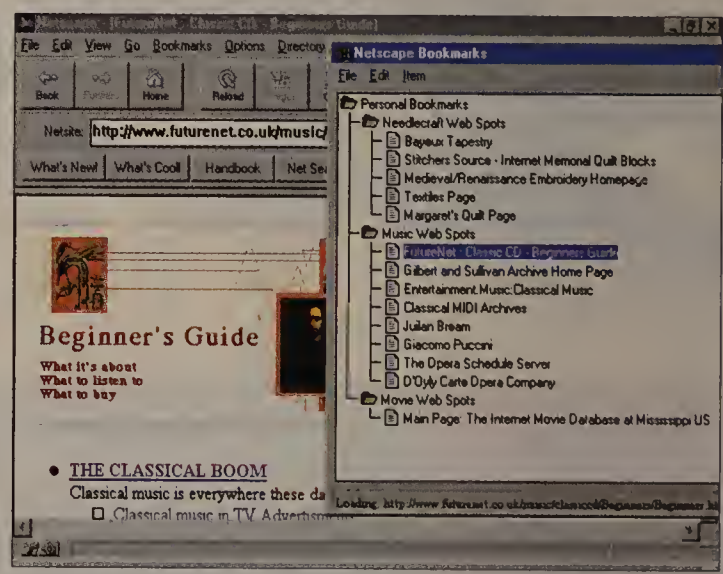
Reader service no. 808

On the Horizon

Almost every major vendor of communications software is rushing to create Windows 95 products. Most wouldn't give me details.

One company that did talk was Delrina, now a subsidiary of Symantec. Delrina will release a package called CommSuite 95 that integrates three components—WinComm Pro 7.0, WinFax Pro 7.0, and newcomer Internet collection Cyberjack 7.0. The three programs, which will also be sold separately, will work with a single user interface.

Among the online services, CompuServe, Prodigy, and America Online have all announced Windows 95 versions of their access software, but none would reveal features or release dates. One Internet tool to watch for is Mosaic In A Box 2.0 for Windows 95, from CompuServe's Internet Division (formerly Spry). This full-fledged 32-bit Web browser will include all kinds of forward-thinking features, including an Electronic Wallet to secure online credit card transactions, plus 3-D Web graphics support and the Adobe Acrobat Viewer.



Netscape Navigator's bookmarks can be arranged by dragging and dropping, à la Explorer.

• **CommSuite 95** list price $179; Delrina Corp.; 800/268-6082, 408/363-2340 (fax)

Reader service no. 809

• **Mosaic In A Box 2.0 for Windows 95** street price $9.95; CompuServe Internet Division; 800/777-9638; Internet mboxinfo@spry.com; www.spry.com

Reader service no. 810

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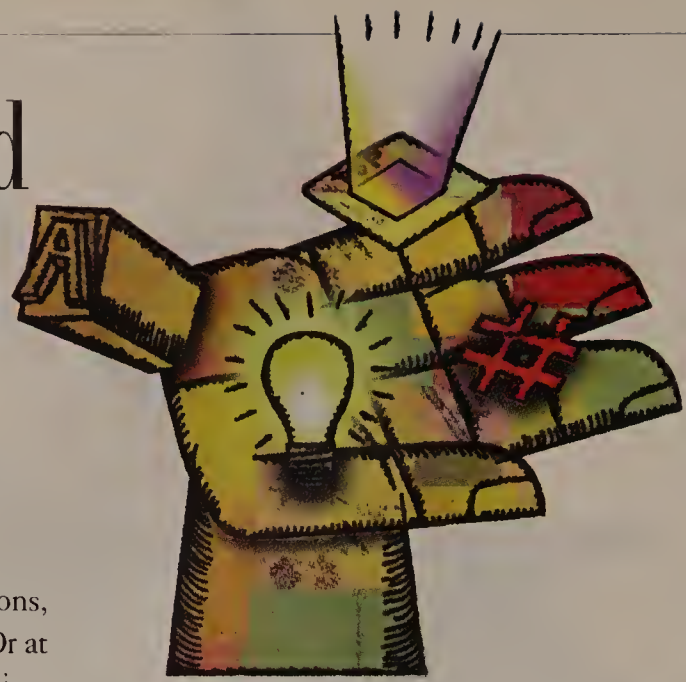
Quarterdeck

Publishing and Presentations

TERRIFIC FIRST IMPRESSIONS

BY DEKE McCLELLAND



If you design pages and presentations, you're going to love Windows 95. Or at least you're going to love the applications available for it. I've examined beta copies of two desktop publishing and two presentation applications, and each one was a winner. If you use older versions of any of these four, you'll want to upgrade as soon as possible. You'll be happy you did.

Why the rush? Publishing and presentation apps are naturals for Windows 95. Its 32-bit architecture speeds up CPU-intensive tasks, and the multithreading makes the programs more responsive. And finally, a lot of companies have used the transition to a new operating system as an excuse to get off their duffs and make major improvements.

Adobe PageMaker 6.0 for Windows 95

The leading high-end desktop publisher has disappointed in recent years. In the last upgrade, for example, new features were scarce and haphazardly executed. Thankfully, Adobe PageMaker 6.0 bucks this trend.

For starters, it supports Kodak Precision, Microsoft's color management system of choice for Win 95. This allows PageMaker to accurately print four-color separations, so the colors you get from your commercial printer will better match what you see on screen. Other long-awaited improvements include the ability to crop imported images inside irregularly shaped outlines, such as triangles and stars, and to create multiple master pages. You can also sharpen Kodak Photo CD pictures without using a separate image editor. And if you want to pass along a file for review, you can add nonprinting comments and lock down page elements.

Windows 95 yields other advantages. I was able to place 50-page text files and large figures into PageMaker without impacting the performance of other tasks. And the program is compliant with OLE 2.0—you can drag and drop text from an OLE server application like Word directly into a text block.

PageMaker is once again a terrific product. It's nice to know that someone at Adobe has finally woken up.

• **PageMaker 6.0 for Windows 95** list price $895, upgrade $149; Adobe Systems; 800/521-1976

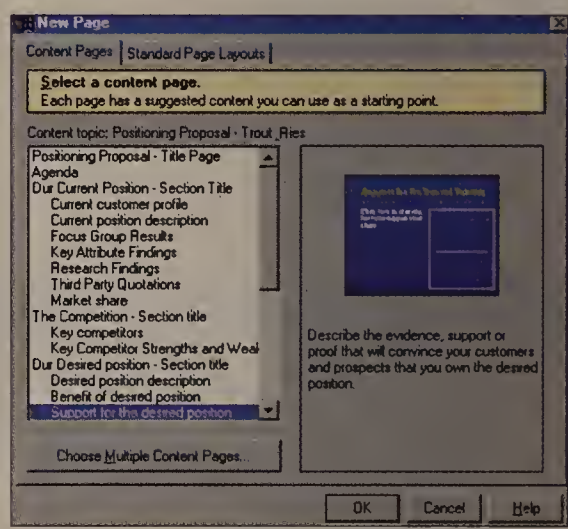
Reader service no. 811

Freelance Graphics for Windows 95

Lotus's Freelance Graphics has long been hailed as the easiest presentation program; the Windows 95 version is no exception. A regular stream of messages suggests options and reminds you of alternatives when you venture down an illogical or unusual path. It's like having a first-rate tutor by your side.

Freelance also has new workgroup features. You can distribute a presentation via floppy disk, by E-mail, or over a network. Coworkers annotate the slides with color-coded edits, comments, and sticky notes.

Freelance has also enhanced its SmartMaster templates, including content sugges-



Content-specific SmartMasters in Freelance Graphics help create effective presentations.

PUBLISHING AND PRESENTATIONS AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
Adobe PageMaker	October 1995	Strong update; supports Kodak's Precision color management system and OLE drag-and-drop functions.
Freelance Graphics	fall 1995	Adds workgroup features and content-specific SmartMasters.
Microsoft PowerPoint	August 1995	First-rate support for Windows 95; new levels of automation and control.
Microsoft Publisher	October 1995	Automates common design tasks and lets you customize pages to your particular needs.
ON THE HORIZON		
Adobe Persuasion	1996	Not available for preview.
CorelVentura	December 1995	Not available for preview.
Harvard Graphics	September 1995	Not available for preview.
Novell Presentations	December 1995	Not available for preview.
QuarkXPress	1996	Not available for preview.

Quarterdeck Mosaic

File Edit View Navigate Hotlist Window Tools Help

Home Back Forward Go To Archives Reload Stop Hotlists Save Trash

How I created this homepage in fifteen minutes.

HTML? What's that? When I wanted to put up my own place on this Internet Web thing, I didn't want to learn some computer language - I remember when Trudy forced me to learn French and we went to this restaurant and I ordered foie gras and the waiter brought me a fingerbowl instead. But if you want to learn HTML, it's fine, click here, and spend a few days turning your brain into dog food.

Speaking of dogs, I'd like to tell you about Rover. The last time we went fishing, he - it's too long, so you'll find that story here. I'd also like to show you the steelhead we caught.

Anyway, back to this home page thing. I used this program called Quarterdeck WebAuthor that actually is invisible (it fits into my Microsoft Word for Windows 6) and I actually wrote this page out like I write letters that the Walla Walla Sentinel doesn't print. Anyway, I highlighted a few words like this one I wanted made into links and the program automatically did that, and I chose a few pictures I thought you might like to see and the program did that too. Here are about 86 pictures from my last fishing trip. I'll put up the rest next week.

Anyway folks, these guys at Quarterdeck (you can reach them at http://www.qdeck.com/) who made WebAuthor are pretty good - they also have other programs, like Quarterdeck InternetSuite that I use to surf the net, you know, and Quarterdeck WebServer that I want to buy next to put up a Web site for my own company, Bob's Bobbing Lures.

Somebody wrote and told me to buy a program to improve styling and usage for the Web and I think that might be cool too.

P.S. I like the word cool - it's cool too.

Document Done

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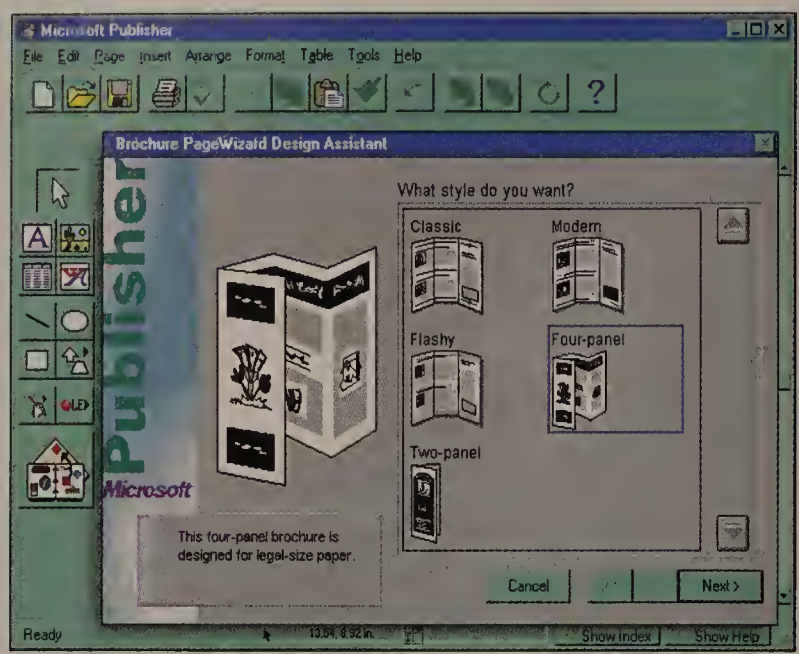
Quarterdeck

tions from experts in marketing and sales. After you select a presentation type, the program displays a recommended series of slides, from which you can pick and choose as you see fit. In addition to the Click Here blocks, each template may include organizational tips and a few paragraphs of advice.



Publisher's design wizards allow novice publishers to slap together complex page layouts with little forethought or effort.

Freelance's support for Windows 95 is not as thorough as some of the other applications I looked at—it doesn't execute background tasks (threads), for example. But it does act as both an OLE 2.0 client and server, so you can embed a Freelance object into another application and vice versa.

Freelance also lacks PowerPoint's extensive multimedia capabilities, but are such things always necessary? Ease of use alone makes Freelance Graphics for Windows 95 a compelling upgrade and a good first choice.

• **Freelance Graphics for Windows 95** price not yet available; Lotus Development Corp.; 800/343-5414

Reader service no. 812

Microsoft PowerPoint for Windows 95

No surprises here: The newest PowerPoint provides archetypal support for Windows 95. The latest version, included in Microsoft Office 95, features independent threads for background printing and slide sorting, so you can initiate either operation, then continue working while the job runs. And of course the familiar dragging and dropping between apps is very much alive and well.

But PowerPoint does more than address the latest Windows gadgetry. It offers a series of automated functions that practically create a presentation for you. My favorite is AutoClipArt, which picks significant words in your slides and suggests graphics to illustrate them. Style Checker verifies spelling and capitalization, and it also makes sure you're not using too many fonts. AutoCorrect fixes misspellings as you type them.

PowerPoint is also highly multimedia-aware. It allows you to apply new animation effects and to load sound and video clips directly from CD-ROM. Although it's not as easy to use as Freelance Graphics, PowerPoint is no challenge, either.

• **Microsoft PowerPoint for Windows 95** street price $339; upgrades $109 through 12/31/95, $129 thereafter; Microsoft; 800/426-9400

Reader service no. 813

Microsoft Publisher for Windows 95

Publisher provides novices and nondesigners with a splendid gateway into the world of page layout. Its PageWizard templates help you create specific types of documents, and with the Design Gallery you can apply different types of headings, ornaments, and page numbers. Publisher is also bustling with special cursors and messages to show you what you can do and where you might be going wrong. These features are nice; I just wish you had the option to turn them off.

Publisher isn't the most Windows 95–compliant app. It has no QuickView support or threads to speak of. But it does support Win 95's color management system and has drag-and-drop support for OLE 2.0. It's still the best tool of its kind for nondesigners.

• **Microsoft Publisher for Windows 95** list price $79.95; Microsoft; 800/426-9400

Reader service no. 814

On the Horizon

The new stand-alone version of CorelVentura is scheduled for release in December. Corel promises that the program will have SGML and HTML authoring tools for publishing electronic pages. QuarkXPress users will have to wait until sometime next year.

For presentations, Harvard Graphics 4.0 should include OLE 2.0 support, automated presentation templates, and a "fixer" mode that hunts for design faux pas. It's still too early to tell what to expect from Adobe Persuasion and Novell Presentations.

• **Adobe Persuasion** price not yet available; Adobe Systems; 800/521-1976

Reader service no. 815

• **CorelVentura 6** price not yet available; Corel Corp.; 800/772-6735 (U.S.), 800/394-3729 (Canada)

Reader service no. 816

• **Harvard Graphics 4.0 for Windows 95** list price $290; upgrades free until 12/31/95, $99 thereafter; Software Publishing Corp.; 800/234-2500

Reader service no. 817

• **Novell Presentations for Windows 95** price not yet available; Novell; 800/451-5151

Reader service no. 818

• **QuarkXPress 4.0** price not yet available; Quark; 800/788-7835, 303/344-3491

Reader service no. 819

PageMaker 6.0 uses Kodak's Precision color management system to convert an RGB image to four-color separations.

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We know you're really concerned about how much memory Windows 95 needs. Not to worry. We're working on an upgrade of QEMM for Windows 95 and it'll be free to all people who buy QEMM 7.5 after July 15, 1995.

The two of us, changing the world – just like old times, Bill.

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Quarterdeck

Graphics Programs

GREAT-LOOKING THREADS

BY DEKE McCLELLAND

There's no doubt about it: Windows 95 is a great platform for designing graphics and touching up photographs. First, there's multithreading, which liberates you from having to wait for one task to end before going on to the next. QuickView helps you see a piece of clip art before you open or import it. And OLE 2.0 makes it a snap to drag and drop text and graphics between programs. The catch: Some applications support these innovations; some don't. Here's how the four graphics programs I looked at stack up.

ABC Graphics Suite

Micrografx is putting all its software in one basket, bundling Windows 95 versions of Designer, ABC FlowCharter, Picture Publisher, and ABC Media Manager into the ABC Graphics Suite. To, uh, sweeten the deal, it has added clip art, photos, diagramming symbols, and fonts. (The programs will no longer be available separately.)

The only part of ABC Graphic Suite I was able to look at was Picture Publisher. If you have version 5.0 (the Windows 3.1 edition), you already have the features found in Picture Publisher for Windows 95—minus some serious speed. My beta copy was at least 50 percent faster than version 5.0, especially when opening Kodak Photo CD images and applying complex special effects.

The program's multithreading capabilities are superb. You can open multiple images and apply effects without waiting for previous operations to complete; you can even manage these tasks as they occur. OLE 2.0 support is similarly spectacular.

Judging the ABC suite by Picture Publisher alone is like judging a book by one chapter. This chapter, though, is surely a good one.

• **ABC Graphics Suite** list price $299.95, upgrade $149.95; Micrografx; 800/676-3110

Reader service no. 820

ClarisImpact 2.0

ClarisImpact is an inexpensive graphics program that handles the usual hoard of bar graphs and pie charts, as well as flowcharts, calendars, and time lines.

Previously available only for the Mac, version 2.0 doesn't exactly showcase Windows 95; there's no support for OLE 2.0, multithreading, or QuickView. But software doesn't get much easier to use. To create an organization chart, for example, you enter names and titles, and click buttons to add subordinates. You can rearrange the chart by dragging boxes around on the page; the connecting lines automatically stretch and bend to keep up.

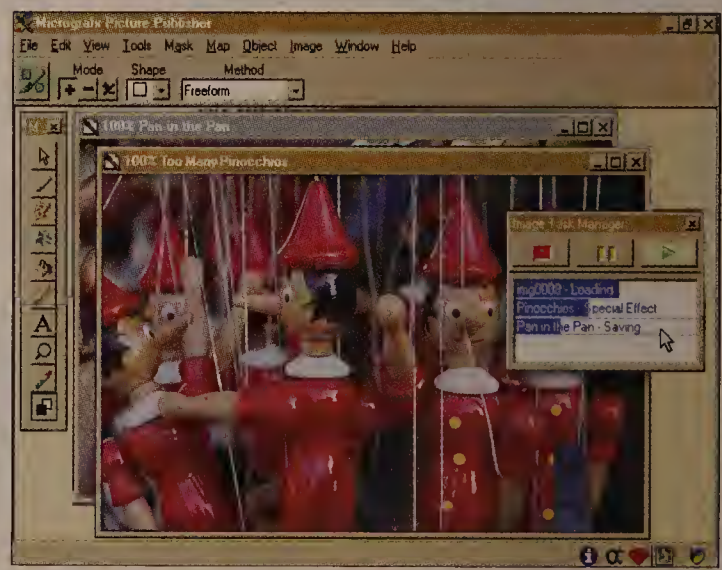
Based on ease of use and price, ClarisImpact is a winner. But if you're looking for a graphics program that takes advantage of your new operating system, look elsewhere.

• **ClarisImpact 2.0** list price $129, upgrade $59; Claris Corp.; 800/544-8554

Reader service no. 821

CorelDraw 6

CorelDraw 6 no longer includes page-layout stalwart Ventura Publisher, but Corel has thrown in a few truckloads of stuff to take its place. There's a 3-D drawing and rendering tool; utilities for creating 3-D type and making it fly around on screen; a browser for managing sound and video files; and more fonts, images, models, and textures than you're likely to sift through in a lifetime.

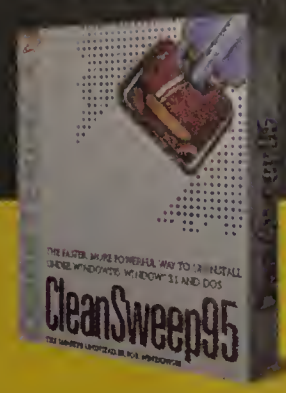


Picture Publisher, part of ABC Graphics Suite, lets you perform several tasks at a time and monitor their progress.

GRAPHICS AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
ABC Graphics Suite	September 1995	Picture Publisher has few new features but is very fast; the rest of the suite wasn't available for preview.
ClarisImpact	August 1995	About as Windows 95–aware as last year's version of Word, but it's easy to use and it's inexpensive.
CorelDraw	August 1995	Incorporates new 3-D modules; its core capabilities are easier to access and use.
Visio	August 1995	Offers document-creation wizards, OLE 2.0 support, and lots of right mouse button options.
ON THE HORIZON		
Adobe Photoshop	October 1995	Not available for preview.

QUARTERDECK



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*Special competitive upgrade offer applies to registered users of Microhelp Uninstaller, Vertisoft Remove-It, Landmark Uninstall-It, IMSI Windelete, and, of course, Quarterdeck CleanSweep. Dealer prices may vary.

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The core applications in version 6's box remain CorelDraw and CorelPhoto-Paint, both improved. CorelDraw now supports larger page sizes and lets you flow text around graphics. And believe it or not, the package finally includes a polygon tool. Improvements to CorelPhoto-Paint include editable text, a list of undoable operations, the ability to open multiple images at a time, and a set of brushes that work like their natural counterparts.

For once, the bundled programs feel like a family. Many options are common and consistent, and you'll be able to swap elements between programs via OLE 2.0, although this function wasn't working in my prerelease copy. Multithreading functions didn't work either, but Corel claims that the final release will include opening, saving, and printing capabilities, plus all Photo-Paint filters.

CorelDraw 6 will be a pricey upgrade ($249 to $425), and frankly, I can't say whether it merits the cost. The prerelease version I saw still needed a lot of work. But if the company comes through on its promises, CorelDraw will pack in more features per dollar than any other graphics package around.

• **CorelDraw 6** list price $695, upgrade $249 to $425; Corel Corp.; 800/772-6735 (U.S.), 800/394-3729 (Canada)

Reader service no. 822

Visio 4.0

Visio has always offered great controls for assembling structured documents—including flowcharts, floor plans, and the like—but it required users to build a drawing from a blank page unaided. This changes with Visio 4.0, which now includes wizards to help users get up to speed. For instance, you can use the SmartShape Wizard to add intelligent behavior to any line or shape, so that it moves and stretches with other objects.

Visio 4.0 is about the best program I looked at for supporting right mouse clicks. And it supports OLE 2.0 in both directions, letting you place a Visio object in another application and put a foreign object in Visio. It even supports the Microsoft Office Binder, so you can combine Visio diagrams with Word pages and Excel worksheets in a single document. These changes aren't exactly groundbreaking, but if you're a Visio user who could use a bit more hands-on help, this upgrade is a reasonable deal.

• **Visio 4.0** street price $149, upgrade $79; Visio; 800/248-4746 x939, 206/521-4500

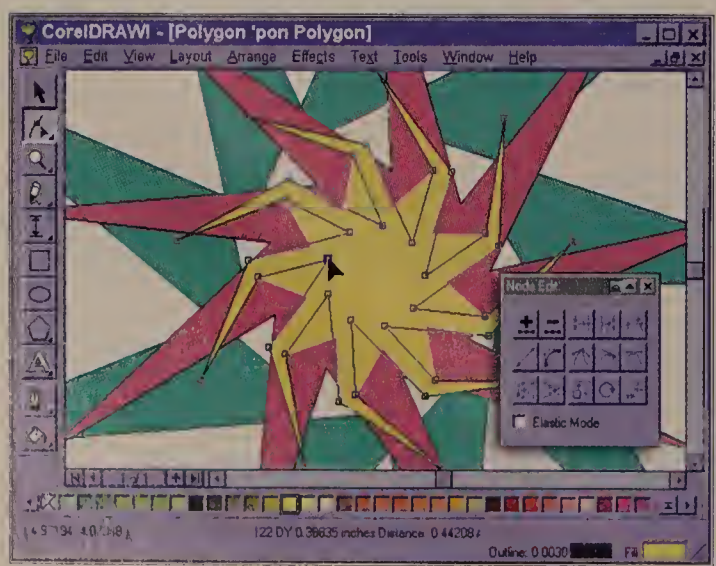
Reader service no. 823

On the Horizon

Only Adobe was willing to talk to me about future products. Photoshop for Windows 95 will function as an OLE 2.0 server and will support 16-bit plug-in filters.

• **Photoshop for Windows 95** list price $895; Adobe Systems; 800/521-1976

Reader service no. 824



CorelDraw 6's new polygon editing controls allow you to add significant points and move them in radial symmetry.

Data Management

KEEPING ONE'S INTEGRITY

BY CELESTE ROBINSON

Databases were the last major software category to make the transition from DOS to Windows. So one would assume that users hoping for Windows 95 databases will have a long wait. One would be wrong.

While such programs aren't about to flood the market, two of them were in beta in time for this article. Meanwhile, several others are waiting in the wings.

4th Dimension 3.5

Here's a program that may do the unthinkable: bring hordes of Macintosh database developers over to Windows. A longtime Macintosh favorite, 4th Dimension 3.5 will run under Windows 3.1, Windows NT, and Windows 95 in addition to the Mac OS, making it possible to create cross-platform database applications. Despite its Windows 3.1 capability, this is a full, 32-bit application with support for long file names.

4D is definitely not designed for new database users—you won't find wizards or experts or assistants to give you a hand. But power users and database developers may like its unique, visually oriented interface, with a view of the relationships within a database. You can easily switch between this window and custom "layouts" for viewing or printing data.

The program doesn't use Windows 95's multithreading, but it manages the trick on its own. You can open windows to perform different tasks concurrently, run a report in one window while entering data in another, or mix and match other database jobs.

What really distinguishes 4D is the way it runs database applications under both Mac and Windows platforms. You can create applications on a Mac and, by changing one setting, have them look like they were developed for Windows 3.1 or Windows 95.

4D is an interesting program. It may not win Windows users or developers over to its camp, but it will bring Mac and Windows operating systems that much closer.

Drivers' Ed

CHAPTER 1:

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Play fast action, high resolution games with ATI's DirectDraw™ drivers.

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All ATI graphics drivers are included with Windows 95 for support from SVGA to *mach32* to today's *mach64* accelerators. And updates can be downloaded from our WorldWide Web site, CompuServe forum or ATI Bulletin Board. With our Windows 95 trained Customer Support representatives, you will receive fast, friendly and knowledgeable support.

To get the most from Windows 95, you need an ATI graphics accelerator.

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- Value priced performance for the home and business
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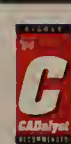
- Priced from $399[4]

Also available, WINTURBO with 2MB VRAM (non-upgradeable)



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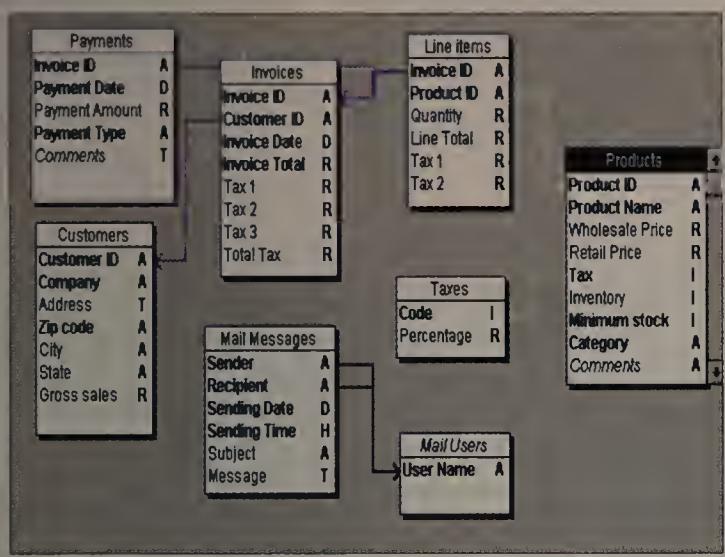
Circle 5 on reader service card



4th Dimension gives you a comprehensive diagram of how your data tables relate.

• **4th Dimension 3.5** list price $895, upgrade not yet available; ACI; 408/252-4444

Reader service no. 825

Microsoft Access for Windows 95

Microsoft has put its end-user database through a rigorous overhaul. We're not just talking long file names here—nearly everything about the new Access is easier and more convenient than ever before, and as flexible as an open-minded contortionist.

To start off, the new Database window looks like Explorer, letting you view database objects as large or small icons, or with detail information. You can drag one of these objects—say, a form or report—onto the desktop to create a shortcut not just to your database file but to that particular object.

Access now gives you several ways to create tables. You can simply type data into a blank table and let Access guess the data types (text, numeric, and so on). Or you can create a group of related tables with the new Database Wizard, which also creates forms, reports, and even a "switchboard" for quick access to all these new objects. Access even includes a tool to analyze a flat table and figure out the best way to organize your data relationally.

Once the data is in place, getting to it is easier, too. Clicking a value and a toolbar button displays all the matching records. And you can now use your data-entry forms to enter search criteria and view the results.

Although Access is not supported by Microsoft's Office 95 Binder, there are still many ways that it integrates with the other apps. The SpellCheck and AutoCorrect features—previously found only in WinWord—can now kick in as you enter and edit data. It's also possible to export Access reports to Word or Excel.

For developers, Access sports a whole new language: Visual Basic for Applications, which is also found in Excel and in Microsoft Project, giving you one language across various applications. Programs written in earlier versions should run under the new language with few if any changes.

Access is an impressive program that makes complex tasks look easy.

• **Microsoft Access for Windows 95** street price $339; upgrade $109 through 12/31/95, $129 thereafter; Microsoft; 800/426-9400

Reader service no. 826

On the Horizon

Other programs are on the way. Lotus Approach 96 for Windows 95 will have Assistants to simplify tasks; enhanced macros; and Lotus Script, an object-oriented programming language that will be in all Lotus products.

Borland's Paradox for Windows 95 will offer new Experts for all types of users and more tools for developers. Claris's FileMaker Pro 3.0 will add the usual Windows 95 features plus new relational capabilities.

• **FileMaker Pro 3.0** price not yet available; Claris Corp.; 800/544-8554

Reader service no. 827

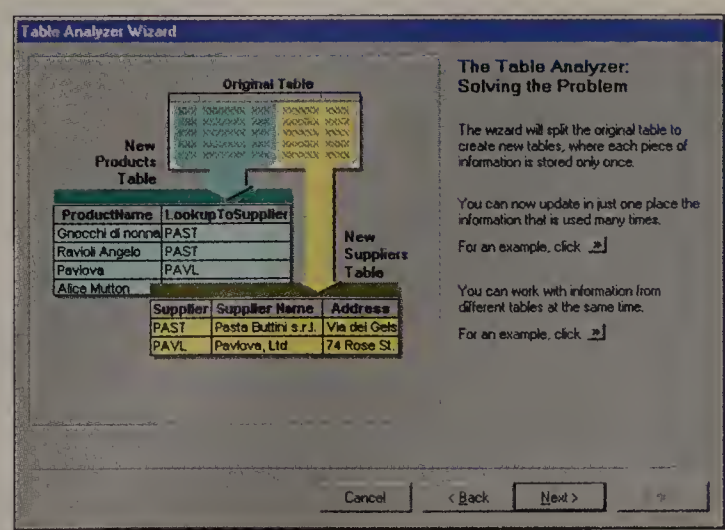
• **Lotus Approach 96 for Windows 95** price not yet available; Lotus Development Corp.; 800/343-5414

Reader service no. 828

• **Paradox for Windows 95** price not yet available; Borland Int'l; 800/233-2444

Reader service no. 829

PC WORLD online *The files from this article are available via PC World Online on America Online and CompuServe. Deke McClelland is author of* CorelDraw for Dummies, PageMaker for Dummies, *and* Macworld Photoshop 3 Bible *(all published by IDG Books Worldwide, 1995, 800/434-3422). Peter Scisco is a writer in Winston-Salem, North Carolina. George Campbell, Scott Dunn, Judy Heim, Celeste Robinson, and Richard Scoville are contributing editors for* PC World.



Access's Table Analyzer Wizard turns spreadsheet data into a group of related database tables.

DATA MANAGEMENT AT A GLANCE

PRODUCT	ETA	BETA EVALUATION
4th Dimension	September 1995	Good for cross-platform app development; supports Mac, Windows 3.x, Windows NT, and Windows 95.
Microsoft Access	October 1995	Excellent upgrade; easier to use than earlier versions; better at sharing data with Excel and Word.
ON THE HORIZON		
FileMaker Pro 3.0	late 1995	Not available for preview.
Lotus Approach 96	fall 1995	Not available for preview.
Paradox	late 1995	Not available for preview.

Introducing
It's More Machine

intel inside pentium PROCESSOR

Extensa 550CD comes with integrated CD-ROM and 16-bit stereo sound for full multimedia capability.

Extensa 550's PCI Bus architecture enables optimal Pentium performance.

PCI BUS

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EXTENSA

EXTENSA 450

- Weight: 5.0 lbs.
- DX4/75 processor
- 10.4" Dual Scan or 9.4" Active Matrix (TFT) display
- 4MB RAM, upgradeable to 32MB
- Serial infrared port

EXTENSA 550

- Pentium 75MHz
- 10.4" Dual Scan display
- 8MB RAM, upgradeable to 40MB
- Serial infrared port

EXTENSA 550CD

- Pentium 75MHz
- Integrated CD-ROM and 16-bit sound
- 10.4" Active Matrix (TFT) or 10.4" Dual Scan display
- 8MB RAM, upgradeable to 40MB
- Serial infrared port

Today, the pressure is on you to do extraordinary things. To squeeze out more productivity than ever before from the same 24 hour day. To do this, you need machines that are more powerful, more useful and more affordable than ever before.

That's why we made Extensa.™

Extensa is the new line of affordable portable computers from Texas Instruments. Computers that, quite simply, give you more machine for the money. The new TI Extensa portable computers offer the most extraordinary combination of speed, weight, power, capability and affordability among leading notebook manufacturers.*

START DOING EXTRAORDINARY THINGS™

Now you can start working faster, start working better, start expanding your capabilities, start extending the power of a Pentium® processor, start using multimedia and, most important of all, start making your money work harder.

So, you can start doing extraordinary things. And it all starts by turning the page.

Extensa 450 is just 5.0 lbs. – subnotebook weight.

TEXAS INSTRUMENTS

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THE TI EXTENSA 450. THE COMBINATION OF WEIGHT,

intel inside

Designed for Microsoft® Windows®95

Just 5.0 lbs. – subnotebook weight.

Wireless printing or file swapping with infrared technology.

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Most Extraordinary Power And Affordability.

EXTENSA 450

- Weight: 5.0 lbs.
- DX4/75MHz processor
- 10.4" Dual Scan or 9.4" Active Matrix (TFT) display
- 340MB HDD
- 4MB RAM, upgradeable to 32MB
- Type II PCMCIA slot (Type III optional)
- Serial infrared port

Now you can get a full-size portable computer, with full-size keyboard and display, that's lighter than a notebook, more capable than a subnotebook, and more affordable than both.

Powered by a 75MHz Intel DX4 processor, the TI Extensa™ 450 weighs just 5 pounds. Which means you'll save weight as well as money. TI Extensa gives you more machine for the money. The combined battery power gives you up to 6 hours of productivity. A serial infrared port gives you wireless connectivity. The removable floppy disk drive gives you support for additional PCMCIA cards, or even a lithium ion battery.

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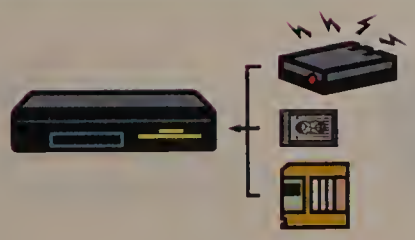
But the affordability of all this technology is what makes TI Extensa truly extraordinary. And makes it easier for you to start doing extraordinary things.

To get your TI Extensa 450 or to find out about our other models, call 1-800-TI-TEXAS. E-mail: 2ti@msg.ti.com. Internet:(www.ti.com).

Versatile floppy drive lets you replace with a second battery (even lithium ion) or PCMCIA slot.



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THE TI EXTENSA 550. NOW YOU
PENTIUM PROCESSOR FOR

TEXAS INSTRUMENTS

EXTENSA

intel inside pentium PROCESSOR

PCI Bus architecture enables optimal Pentium performance.

PCI BUS

Infrared communications technology lets you swap files or print without wires.

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CAN GET THE POWER OF A THE PRICE OF A 486.

EXTENSA 550

- Pentium 75MHz
- PCI Bus architecture
- 256KB L2 cache
- 10.4" Dual Scan display
- 8MB RAM, upgradeable to 40MB
- 524MB HDD
- Type III PCMCIA slot
- Optional CD-ROM
- Weight: 6.2 lbs.
- Serial infrared port

There are many portable computers from leading manufacturers priced like the new TI Extensa™ 550. Trouble is, they probably don't come with Pentium® processors. They use DX4 or DX2 processors to power the machines. That's a whole generation–or two, behind.

And that's just the beginning. The new TI Extensa 550 extends the power of its Pentium processor with 256KB of L2 cache, allowing the processor to work at maximum operating efficiency.

START DOING EXTRAORDINARY THINGS™

What's more, the TI Extensa 550 uses the same circuitry (called Peripheral Component Interconnect or PCI) used in most desktop models for blazingly fast video monitors and improved disk drive performance. The TI Extensa 550 also comes with a serial infrared port, which lets you print or share files, wirelessly.

Thus enabling the TI Extensa 550, and its owner, to do some extraordinary things.

To get your own TI Extensa 550 or to find out about our other models, call **1-800-TI-TEXAS**. E-mail: 2ti@msg.ti.com. Internet: (www.ti.com).

Faster, more efficient processing from L2 cache (256KB).

TEXAS INSTRUMENTS

Circle 244 on reader service card

The TI Extensa 550CD. At
This Multimedia Powerhouse

intel inside pentium PROCESSOR

Integrated CD-ROM and 16-bit stereo sound for full multimedia capability.

PCI Bus architecture enables optimal Pentium performance.

PCI BUS

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TS PRICE, THE ONLY THING DOESN'T HAVE IS COMPETITION.

16-bit stereo sound for full multimedia capability

Built-in speakers and microphone

Full-motion video for dramatic sales presentations

Weighs 6.4 lbs.

Serial infrared port lets you swap files without wires

Removable 524MB hard disk drive

Powerful 75MHz Pentium processor

Integrated CD-ROM player (interchangeable with floppy disk drive or a lithium ion battery)

EXTENSA 550CD

- Integrated CD-ROM
- Pentium 75MHz
- PCI Bus architecture
- 256KB L2 cache
- 8MB RAM, upgradeable to 40MB
- 524MB HDD
- 10.4" Active Matrix (TFT) or 10.4" Dual Scan display
- 1MB video memory
- 16-bit stereo sound card, microphone and speakers
- Type III PCMCIA slot
- Weight: 6.4 lbs.

Thanks to the new TI Extensa™ 550CD, now you can't afford not to take Pentium® multimedia on the road.

At its low price, you might find other portable multimedia machines, but they probably won't have Pentium processors, and if they do, they're not likely to have a built-in CD-ROM. But that's just part of the TI Extensa 550CD's superiority. For better high-speed video and optimal performance for CD-ROM applications, the TI Extensa 550CD uses the same circuitry (called Peripheral Component Interconnect or PCI) used in most desktop computers.

START DOING EXTRAORDINARY THINGS™

There is also the extra convenience and versatility of the removable CD-ROM drive which allows you to use an internal floppy drive, or even to support a lithium ion battery for longer performance. And with a serial infrared port, the TI Extensa 550CD can print or share files, wirelessly.

To find all the capabilities of the TI Extensa 550CD at this price is extraordinary.

To get these capabilities working for you or to find out about our other models, call **1-800-TI-TEXAS**. E-mail: 2ti@msg.ti.com. Internet: (www.ti.com).

Remote control operation thanks to serial infrared technology.

TEXAS INSTRUMENTS

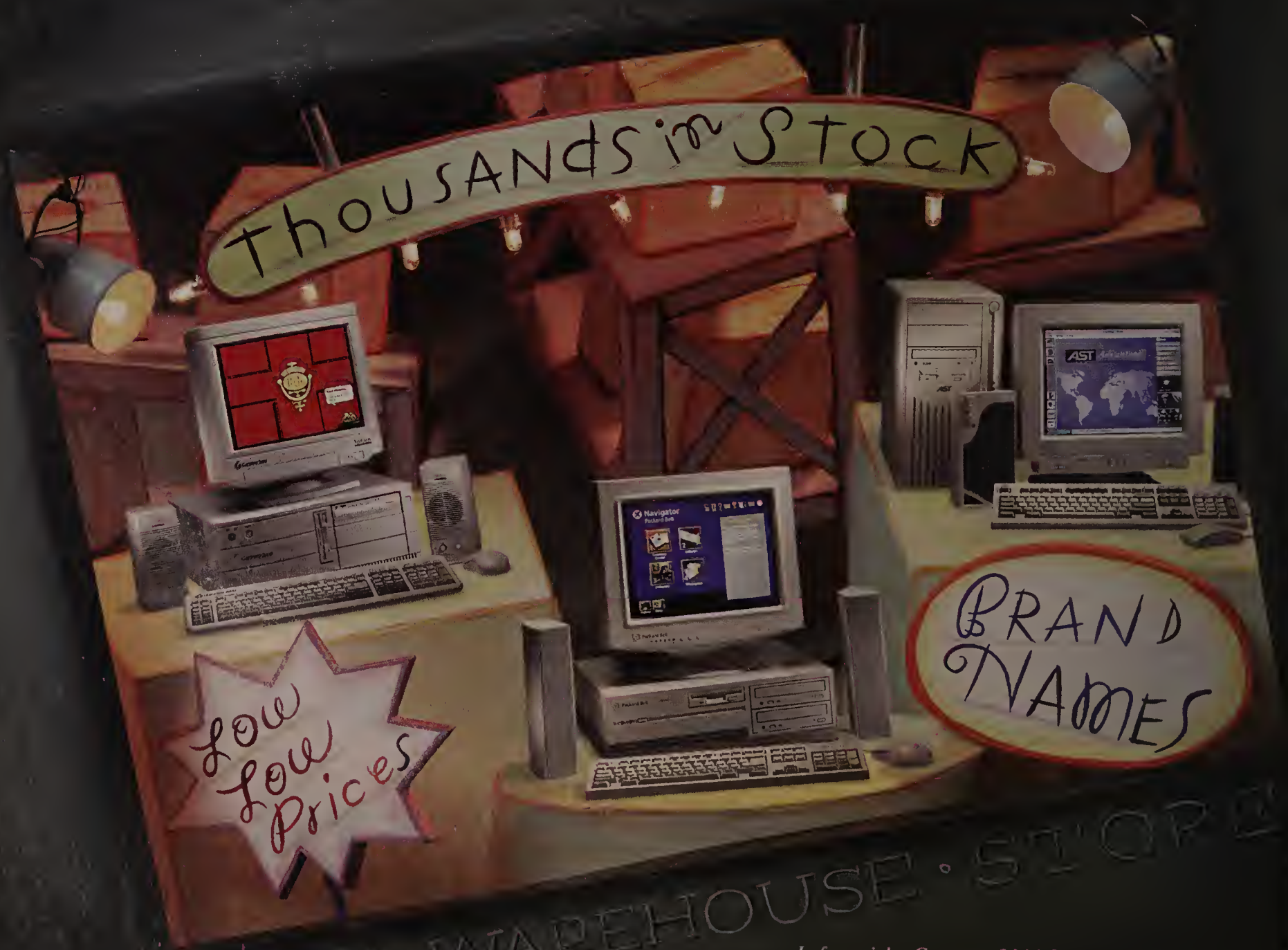
Circle 235 on reader service card

Cheap PCs: Brand

Beware of prices that sound too good to be true. They are. Our tests of big-

Is it finally time for you to commit a sizable chunk of your Visa card's credit limit to a new home PC? If you're buying on a budget—and spending your own hard-earned money—you want to get the most computer you can for the fewest dollars.

Finding inexpensive systems is easy in today's cutthroat PC market. Without devoting much time to the project, you can track down multi-



Left to right: Gateway 2000 P5-75 Family PC, Packard Bell Legend 418CD, AST Advantage Adventure 8075p

Name vs. Brand X

name and locally assembled PCs show that a bargain isn't always a bargain.

By Theresa W. Carey

media-equipped Pentium PCs for well under $2500 from a range of sources, including local shops that put together their own systems, as well as consumer electronics retailers and computer superstores that offer models from well-known manufacturers. But it can be difficult to tell whether a locally assembled system or one with

CONSTRUCTIONS BY BUD PEEN

t: Escape System Pentium-75
ght: Hi-Tech USA Pentium-75

How to Save a Buck When Buying a PC

The Best Ways

• If you're replacing an older PC, consider keeping components such as its monitor, keyboard, and mouse, if your vendor will sell you a new PC without them. (You can also preserve internal parts including RAM, a hard disk, or a video card, but older equipment may bog down your performance or be incompatible.)

• Having 16MB of RAM will boost your productivity, but starting with 8MB is still satisfactory for most applications and will save you around $160. You can always upgrade later, as long as you specify when buying your PC that it must offer open banks for more memory. (Don't start with anything less than 8MB, though.)

• Cutting-edge graphics controllers use costly VRAM memory. Unless you plan to use your system for graphics-intensive purposes, a PC with a less expensive DRAM-based controller will give decent performance in most applications.

• Don't be dazzled by ads touting 20 or 30 bundled software applications. Check the specific titles of the programs you get, and don't pay a premium for them unless they're products you really want.

The Worst Ways

• Beware of PCs that offer no secondary memory cache; unless they use EDO RAM, they're likely to be weak performers. (Some Pentium PCs may claim a 16K cache, but this refers to the CPU's standard on-chip cache, not a secondary cache, which is typically 256K or larger.)

• Make sure you don't buy a PC with a monitor whose dot pitch specification is .39mm; this results in a fuzzy display that can make your eyeballs ache over time. Look for a monitor with a dot pitch of .28mm or less.

• Almost any Pentium PC you encounter will offer expansion slots that use the speedy PCI bus architecture. But some vendors pinch pennies by using slower ISA (or in some cases VLB) cards, leaving the PCI slots unoccupied. Specify that you want a PCI graphics card and a PCI hard disk adapter.

• Bargain-basement PCs may use hard drives that offer only 420MB, 270MB, or even smaller capacities. That's not enough for today's programs; even if you're on a strict budget, don't settle for less than a 540MB hard disk.

—Harry McCracken

a famous nameplate is more likely to keep you happily computing for years to come—or what the manufacturer may have sacrificed to keep the price down. To discover what you can expect from low-cost systems, we took a hard look at some representative locally assembled PCs, as well as several inexpensive brand-name machines that are widely available through retail chains.

As nice as it may have been to find out that these cheap systems were just as good as their pricier counterparts, it wasn't the case. In the end, none of the inexpensive models were as well rounded as the PCs that make our monthly Top 20 charts—and even the quickest among them were no speed demons by today's standards. The brand-name systems were on average somewhat faster, more feature-laden, and easier to set up than their locally produced cousins, but they were also more expensive. Our conclusion: You get what you pay for, and these PCs' lowball prices are accompanied by significant limitations, especially in terms of performance.

For this article, we focused most of our attention on the PCs themselves, rather than the buying experience you can expect in each type of store. (For a look at what it's like to shop at local retailers, superstores, and other marketers, see "Let's Make a Deal," March 1995.)

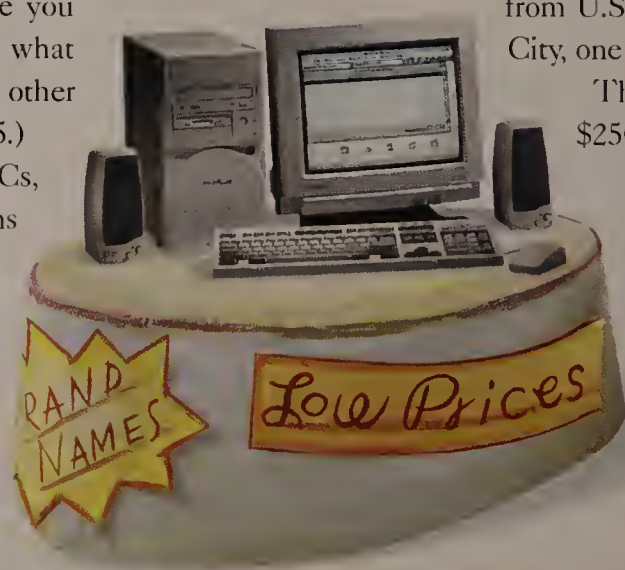
Although we were on the hunt for low-cost PCs, we didn't want to end up with spartan systems that couldn't run current software and serve faithfully for at least a few years into the future. We set our maximum budget for each system at $2500, and we settled on a pleasing entry-level configuration for family or home-office use: a 75-MHz Pentium system with 8MB of RAM, a double-speed or faster CD-ROM drive, a 16-bit sound card, and a 15-inch monitor.

For our tests, we chose locally assembled PCs from two Boston-area vendors: MicroSmart, located in Ashland, Massachusetts; and Computer Escape, a store in Randolph. We also brought in systems from two retailers in the San Francisco Bay Area: Milpitas-based Hi-Tech USA and the Sunnyvale branch of HiQ. Naturally, you'll likely consider purchasing from these particular retailers only if you live in the areas they serve, but you can use our experiences as a general guide when you shop at stores in your area.

The other four systems we picked are all low-cost, national-brand models. We tested Packard Bell's Legend 418CD (sold under varying names by different retailers) and AST's Advantage Adventure 8075p—both home-oriented multimedia systems from two of the most prominent PC lines sold through consumer electronics stores. We also tested the P5-75 Family PC from Gateway 2000, which sells its computers through mail order; and the P 5 Multimedia PC from U.S. Logic, the house brand of Computer City, one of the largest superstore chains.

The systems were priced well below our $2500 ceiling, ranging from $1893 for Hi-Tech USA's PC to $2399 for the AST.

What you encounter when you set up your new system can define your entire working relationship with a



The P 5 Multimedia System from U.S. Logic

computer. We began our evaluation of the eight Pentium-75 PCs by unpacking and assembling them, following the instructions that came with each unit and doing our best to rely on the information provided rather than on our existing computer knowledge. It took us 20 to 40 minutes to perform the initial setup for each system.

Only two of our brand-name PCs (the Gateway and the Packard Bell) and one local PC (the HiQ) started up right away. The other five didn't work properly out of the gate, for reasons ranging from faulty components to loose cables.

In general, the brand-name systems came packed in neatly organized containers, with the items arranged in a logical fashion inside. The systems from local vendors weren't as professionally packed. Hi-Tech USA, for example, stuffed some of its books and disks into shopping bags that were bursting at the seams.

HiQ's and MicroSmart's Pentium-75 multimedia PCs

Except for the U.S. Logic system, all the brand-name models came with a poster-size setup guide detailing which items were in the cartons and what to do with them. The locally assembled PCs, as well as the U.S. Logic, lacked such helpful printed materials. At best, they included an invoice or packing slip that provided some assistance in figuring out whether everything we ordered was accounted for. The local companies also didn't make much effort to identify which cable went with which port; several units presented multiple options for plugging in certain components.

By contrast, the AST and Gateway machines were well labeled except for the speakers. Packard Bell did the best job, color-coding the cables and ports so that it was a snap to figure out where to hook up the monitor cable, keyboard, and mouse. Oddly enough, the Packard Bell still took the longest to set up, due almost entirely to the seemingly simple task of connecting its speakers. They had to be fastened to the sides of the monitor with several pieces of mounting hardware; it makes for a nice-looking unit, but it was a remarkably clumsy job even with two people working on it.

When we had the systems assembled, we flicked on the power switches and crossed our fingers. Of the local machines, only the HiQ worked as expected. The cable that connected the Escape System's hard disk to its controller card was loose; we discovered this when the system wouldn't boot. The Hi-Tech USA unit gave intermittent hard disk errors, a problem that persisted even after we brought the machine back to Hi-Tech USA twice for service. And the MicroSmart had a defective RAM module, which didn't prevent the system from running most programs but did stop it from completing our performance tests; we replaced the RAM so we could complete our benchmarks.

Our brand-name models didn't do much better. The Gateway 2000 and Packard Bell units started up without incident, but the AST had a loose power cable inside the case, and the U.S. Logic's monitor had a defect that caused it to behave as if it weren't plugged into the PC. Before we could proceed, we had to resolve all these problems either on our own or by contacting the vendor.

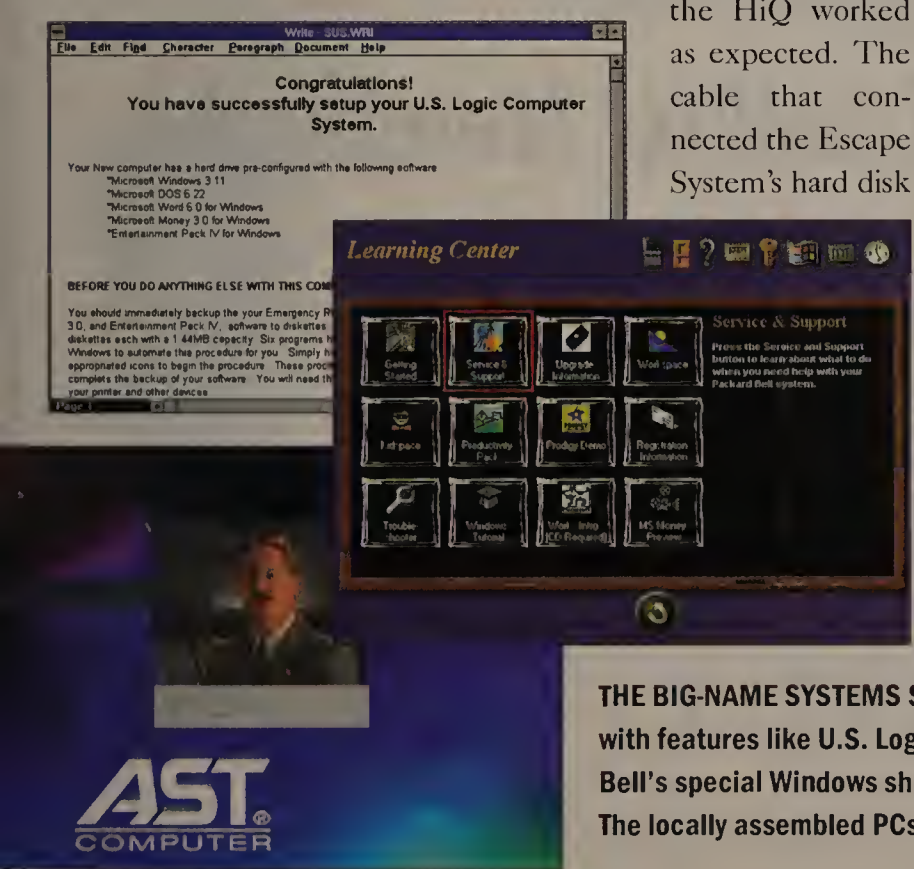
Software Bells and Whistles

Once we got the hardware working correctly, we checked out each PC's software to see if it was ready to go right out of the box, without requiring us to tinker with drivers or other setup issues.

Though Windows was installed on every system, all the local machines except the MicroSmart were set up to enter DOS upon start-up—a little surprising given that nearly all the software they included ran under Windows. MicroSmart and Gateway set up their systems to boot into Windows, while the other big-name machines provided bells, whistles, and an electronic red carpet to welcome us to our new computer.

The AST had the most elaborate introductory show, starting with an animation of the company logo. Next was a video message from AST's president and a reminder to do a system backup. After this ceremony, the AST brought us into AST Works, a replacement for Windows' Program Manager that aims to make it easier for beginners to manage their programs and files. The Packard Bell system offered Navigator, a similar Windows shell that provides separate interfaces for kids and grown-ups. U.S. Logic's PC didn't greet us with a slick, interactive welcome, but it did pop up a congratulatory letter the first time we booted it.

Once each machine was in Windows, we set out to accomplish four tasks: sending a fax (except on the Escape System, which lacked a



THE BIG-NAME SYSTEMS STEERED US THROUGH SETUP with features like U.S. Logic's on-screen letter, Packard Bell's special Windows shell, and AST's video welcome. The locally assembled PCs lacked these friendly touches.

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T2110CS*:
- 10.4" dia. color dual-scan STN display
- 350 Million Bytes (=330MB) HDD
- 4MB of RAM expandable to 28MB

ALL MODELS:
- 75MHz Intel DX4™ processor
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- 16KB cache
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outperform 100MHz systems while optimizing precious battery life. But that's just the beginning. You also get a big 10.4" diagonal color display, a built-in power supply so there's no bulky external AC adapter, an AccuPoint™ integrated pointing device, Plug and Play expansion, rugged construction and more.

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†T2110CS. Reseller prices may vary. All prices and specifications are subject to change. *The T2130CS and T2110CS are sold at selected retailers as the T2135CS and T2115CS with Microsoft Windows® 95 and additional pre-installed software.

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Circle 228 on reader service card

modem), playing a video clip from Microsoft's Encarta multimedia encyclopedia, venturing a bit into the world of Broderbund's Myst CD-ROM game, and playing an audio CD.

For the most part, these tasks went smoothly on all the systems. The biggest obstacle we faced in the fax test was with the MicroSmart system; it didn't indicate which modem jack was for the phone line, and—inevitably—on our first try we chose the wrong jack. The Encarta clip ran on all the systems, and we easily installed and played Myst on every model except the AST, which had an incompatible video driver set as its default.

The Inside Story

Once a system is running, its components will show their strengths and weaknesses. (See "Brand-Name PCs Have More Features—And Higher Prices" for statistics on the eight systems we evaluated.)

Five of the systems came in minitower cases; the HiQ came with a full tower case, and the Gateway and Packard Bell systems were in standard-chassis compact desktop cases. Most had a decent number of empty drive bays and slots available for upgrades—except the Packard Bell, which had no space for an additional hard disk, a tape drive, or another storage device, since its full complement of drive bays was full. Since these PCs have so much in common and the local models are on average about 10 percent cheaper, it's easy to conclude that the local ones provide more for your money. But studying them closely reveals differences that help explain the price variations.

All these systems included basic multimedia hardware—a CD-ROM drive, a sound card, and speakers—but the brand-name PCs tended to come with more multimedia extras. For one thing, they all can serve as a digital answering machine, something none of the local PCs could do. Gateway's system included the company's clever three-disc quad-speed CD-ROM changer, and the Packard Bell came with two double-speed CD-ROM drives.

The big-name PCs also offered more impressive software bundles, particularly the Gateway, which included no fewer than 16 productivity, reference, and entertainment packages. Good games weren't hard to find in the software bundles from Computer Escape and HiQ, but useful productivity programs were; the Hi-Tech USA and MicroSmart systems included only DOS, Windows, drivers, and communications software.

One of the best ways to judge the value a PC offers is to see how much its components would cost if bought separately. The $1893 Hi-Tech USA system, for instance, was the least expensive PC we tested, but it also came with the skimpiest hard drive—545MB. The $2399 AST system, however, had a 1GB drive, a luxurious amount of disk space for an entry-level PC. After a little research, we found that the Hi-Tech USA's drive cost about $180 if bought separately, while the AST's drive carried a price tag of around $430—making up about half the cost difference between the two PCs in a single component.

It's not always possible to compare prices this way, especially if you're considering systems with components from lesser-known manufacturers, or generic parts of unknown origin. Another reason to gravitate toward PCs with parts from well-established suppliers: No matter how obscure a PC vendor is, you can research its components by reading reviews, talking to friends, and monitoring online forums. None of the problems we encountered could be traced directly to generic parts, but if you can't identify a component, it's nearly impossible to predict how well it will serve you.

What if you don't like some of the components in a PC you're considering? If it's a PC sold through consumer electronics retailers and superstores (such as the AST, Packard Bell, and U.S. Logic systems we evaluated), you're probably out of luck. These are usually sold as fixed configurations: You can't make switches such as opting for a faster video card from another vendor (or, for that matter, saving a few dollars by choosing a lesser video card).

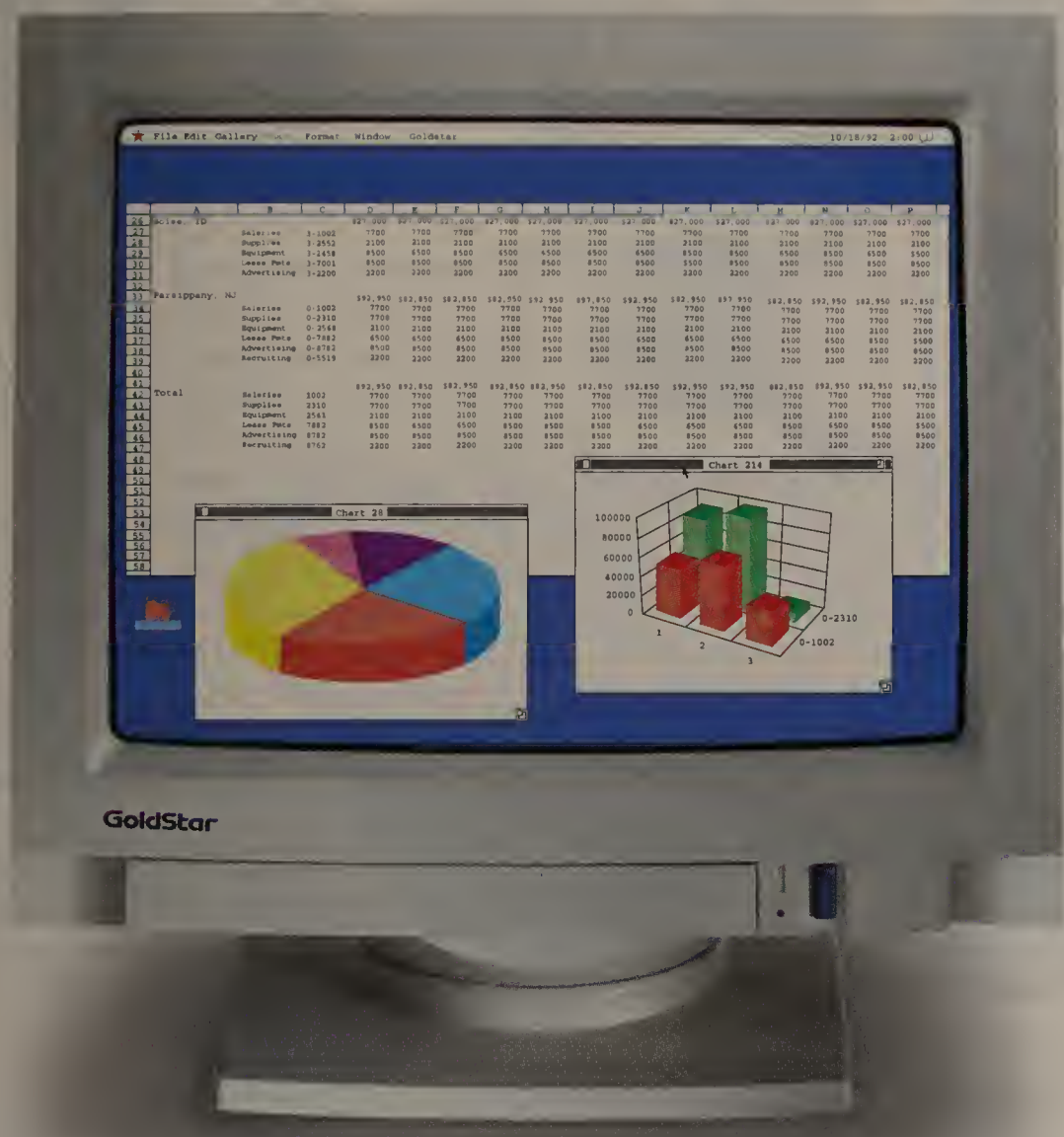
Companies like Gateway 2000 that sell direct by mail, on the other hand, generally custom-assemble PCs and will diverge from standard configurations to meet your needs, as long as you're substituting components they carry. Many local vendors go even further, letting you specify components from manufacturers you choose.

How to Buy Locally—And Like It

If you decide that buying a locally assembled PC is for you, follow these tips to make sure your experience is a happy one.

- **Follow the 5/15 rule of Steve Bass, president of the Pasadena IBM Users Group and a *PC World* contributing editor: "Make sure the store has been in business at least 5 years and is no more than 15 miles away. If it has been around 5 years, it'll likely be around another 5, and if the computer needs servicing, you can be there in no time."**
- **Insist on a specification sheet that clearly states the agreed-upon price, a breakdown of components, and all service and support policies. It will help you to comparison shop and will prevent dealers from backing down on their promises when it comes time for you to buy.**
- **Don't buy from any vendor that doesn't have a 30-day money-back guarantee, and aim for a no-questions-asked guarantee with no restocking fee. If the store charges such a fee (typically 5 to 15 percent of the purchase price) and you return your PC, you could pay a penalty of several hundred dollars.**
- **Pay for your purchase with a credit card, even if the store offers a discount for cash purchases. In case of any after-the-sale disputes, your credit card company can be your best friend and chief advocate in getting a refund.**
- **When you get your new PC home or to your office, set it up right away and compare what you got with the spec sheet or invoice. Immediately contact the vendor if there are any discrepancies.**

LG Electronics



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Model 2010
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18.8" viewable image size; digital on-screen controls include RGB, color temperature, zoom and tilt; 30 memory settings (18 user storable); anti-reflection, anti-static coating (AR-ASC); .28mm dot pitch; dynamic focusing; up to 1280x1024 @ 77 Hz, flicker-free; auto-scan to 1600x1280 NI; MPR II compliant; VGA and BNC inputs.

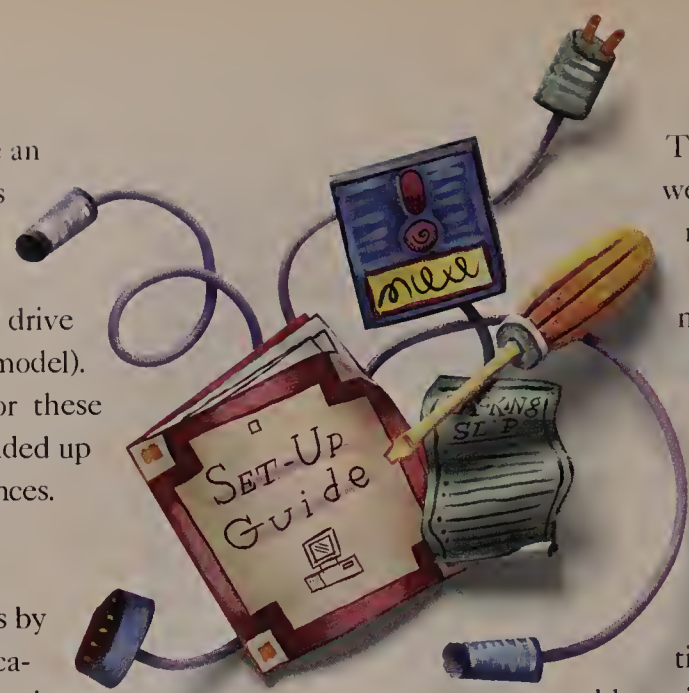
Model 1727
17 inch Color Monitor

FST, 16.1" viewable image size; digital on-screen controls include zoom, tilt and auto diagnostic; 34 memory settings (27 user storable); non-glare, anti-static coating; .28mm dot pitch; dynamic focusing; up to 1024x768 @ 76 Hz, flicker-free; auto-scan to 1280x1024 NI; MPR II compliant.

Model 1527
15 inch Color Monitor

FST, 14" viewable image size; digital on-screen controls include RGB, color temperature and zoom; 40 memory settings (32 user storable); non-glare, anti-static coating; .28mm dot pitch; up to 1024x768 @ 76 Hz, flicker-free; auto-scan to 1280x1024 NI. MPR II compliant.

Indeed, for our HiQ system we chose an Intel motherboard (rather than HiQ's house brand), a U.S. Robotics modem (rather than the standard Zoltrix one), and a quad-speed Diamond CD-ROM drive (rather than the standard double-speed model). We paid a total premium of $175 for these options—not bad considering that we ended up with a PC tailored exactly to our preferences.



Speed or the Lack Thereof

We tested the speed of the eight systems by putting them through the same application-based benchmarks we use in evaluating PCs for our monthly Top 20 charts. The results were disappointing: Even the fastest machines provided uninspired performance compared with the quickest Pentium-75 systems that have made the Top 20. Although all the brand-name systems except the AST outpaced the local ones, they were still markedly slower than the average of other Pentium-75 PCs that we've benchmarked (see "Low Cost Can Mean Slow Performance").

Why weren't these computers—all of which sported Pentium processors, respectable amounts of RAM, and up-to-date bus architectures—any faster? It's likely the result of small compromises that the vendors make to cut costs—compromises that quicker, generally more expensive configurations in our Top 20 are less likely to have.

For example, only the Gateway 2000, HiQ, and Packard Bell systems included Windows for Workgroups 3.11, thereby enabling them to take advantage of its 32-bit File Access feature, which can noticeably boost the speed of disk-intensive tasks. (The other PCs used Windows 3.11, which doesn't have 32-bit File Access.)

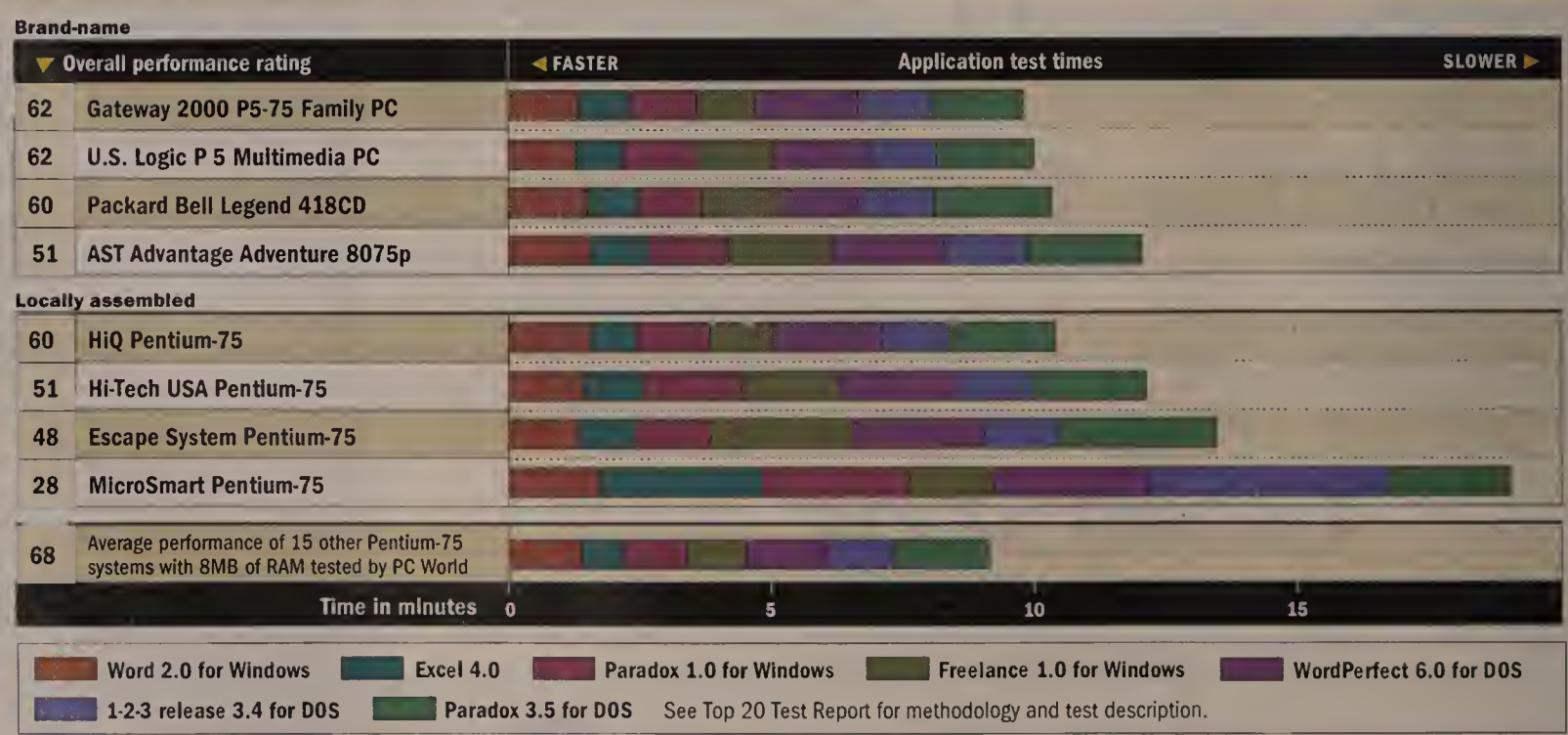
The AST was the slowest brand-name system we tested, and the fact that it didn't supplement the Pentium CPU's built-in 16K cache with a secondary cache didn't help its performance. The Packard Bell and Gateway systems also lacked a secondary cache, but they used EDO RAM, a type of memory whose fast performance helps compensate for the absence of a secondary cache.

In the case of the MicroSmart system—by far the slowest of the eight systems and one of the most sluggish Pentium models we've seen—much of the blame is probably due to its graphics controller, a 16-bit ISA model that's an anachronism by today's standards. To complete our benchmarks, the system needed more than *twice* the average time of other Pentium-75 PCs with 8MB of RAM we've tested. (In addition, the MicroSmart system we bought included the ISA card even though our purchase order specified a VLB model—a painful reminder that it's vital to double-check to make sure you get the PC you paid for.)

These results confirm a fact you should always keep in mind when shopping: The CPU is only one of many factors that determine the kind of speed you can expect from a PC, and systems based on a particular processor can differ wildly in benchmark tests.

The Service Behind the PC

The minor and major hardware flaws we experienced with most of these systems drive home how important it is to carefully analyze the service and support policies that back any computer you're considering buying. Three of the four brand-name machines we tested



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come with a three-year warranty for parts, with on-site service included for the first year—a typical policy among large PC manufacturers. (Packard Bell's one-year parts and labor warranty is a bit behind the times, although it does include on-site service.)

Policies are less consistent among the local vendors, but all offer at least a year's warranty, often with longer labor warranties. MicroSmart offers the most impressive warranty of any of the eight systems we tested, with five years' coverage for parts (except for a three-year monitor warranty), and lifetime free labor.

However, free on-site service is a rarity with locally assembled computers. If something goes wrong with a machine put together by one of our four local vendors, you have to repack the system and haul it back to the place of purchase for repair. And while toll-free support is virtually universal among brand-name manufacturers, local stores may not offer it: HiQ and MicroSmart do, but Computer Escape and Hi-Tech USA don't.

Of course, you don't need to worry about 800-number support if you bought your PC from a store that's just a local call away. Also, having to drive a system back for repair isn't a serious burden if you've purchased it from a nearby store—and in general you

Brand-Name PCs Have More Features–And Higher Prices

● = Yes ○ = No

n/a = not applicable

	AST Advantage Adventure 8075p	Gateway 2000 P5-75 Family PC	Packard Bell Legend 418CD [1]	U.S. Logic P 5 Multimedia PC	Escape System Pentium-75
Standard features	BRAND-NAME				LOCALLY ASSEMBLED
Street price as of 6/15/95	$2399	$2229	$2359	$1999	$2010
Expansion bus type	ISA/PCI	ISA/PCI	ISA/PCI	ISA/PCI	ISA/PCI
Installed/maximum RAM (MB)	8/128	8/128	8/72	8/512	8/192
Secondary RAM cache installed/ maximum (K)	0/0	0/0	0/0	256/1024	256 /1024
Case style	minitower	compact	compact	minitower	minitower
Hard disk	WD Caviar 31000	WD Caviar 2700	Seagate ST31220A	Seagate ST5850A	Samsung SHD-30560A
Size (MB)	1083	731	1083	855	561
Graphics adapter (bus type)	Cirrus Logic GD-5430-C–based (integrated PCI)	STB Powergraph 64 (PCI)	Cirrus Logic GD-5430–based (integrated PCI)	Hercules Stingray S801 (PCI)	generic Cirrus Logic GD-5434–based (PCI)
Installed DRAM (MB)	1	2	1	1	1
Monitor	AST Vision 5L	Gateway Vivitron 1572	Packard Bell 1511/125L	U.S. Logic KD-1500U	Mag DX15F
Tube (diagonal inches)/viewable area (diagonal inches)/dot pitch (mm)	15 /13.5/.28	15/14/.25	15/13.5/.28	15/13.5/.28	15/14/.28
Modem vendor/data speed/ fax speed (kbps)	AST/ 14.4/14.4	Gateway/ 14.4/14.4	Packard Bell/ 14.4/14.4	Askey/ 14.4/14.4	n/a
Sound board	Creative Labs Vibra 16	Creative Labs Vibra 16	Packard Bell (integrated with modem)	Media Vision Jazz 16	Creative Labs Vibra 16
CD-ROM drive/speed	Toshiba/4X	Sanyo/4X (3-disc changer)	Matsushita/2X (2 drives)	Toshiba/4X	Teac/4X
Other bundled software	Lotus Organizer, Microsoft Works, Quicken, StartCom, Windsurfer, WinFax Lite	Bob; Bookshelf; Cinemania; Encarta; FaxWorks CallCenter; Microsoft Money, Publisher, and Works; and 8 others	FaxWorks CallCenter, Grolier's Encyclopedia, Microsoft Works, World Atlas, and 10 others	BitCom, BitFax, Bookshelf, Encarta, Microsoft Money, Microsoft Word, and 3 others	Allie's Playhouse, Expresso, Scooter's Magic Castle, Top 10 CD-Combo
Service and support					
Warranty on parts/labor (years)	3/3	3/1	1/1	3/3	1 [2]/lifetime
30-day money-back guarantee	[4]	●	[4]	●	● [5]
Free on-site service (years)	1	1	1	1	○
Daily phone support (hours)	24	24	24	12	8
Toll-free support/weekend support	●/●	●/●	●/●	●/●	○/●
Contact	800/876-4278	800/846-2000	800/733-5858	800/544-2936	617/961-1234
Reader service number	764	765	766	767	768

[1] Sold under varying names.
[2] Longer warranties for some parts.
[3] Three-year warranty for monitor.
[4] Dealer handles return policies.
[5] Returnable only if defective.
[6] 15 percent restocking fee; monitor and other peripherals carry no money-back guarantee.

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should consider buying a locally assembled computer only from a dealer that's an easy drive from your home or office.

Almost all the systems we tested were backed by a 30-day money-back guarantee, an important option if the PC turns out to be a lemon or if you simply find a better deal elsewhere after the purchase. AST and Packard Bell, however, leave such policies up to the dealers that sell their systems. (Both companies' products are widely available through consumer electronics retailers and PC superstores that offer hassle-free money-back guarantees.)

Two of the local PCs' money-back guarantees came with serious strings attached: Computer Escape's guarantee applies only if your PC is defective—you can't get a refund just because you find the performance lackluster or you decide you really need a roomier case. And Hi-Tech USA's money-back guarantee covers only the system itself (not the monitor or other peripherals) and requires that you pay a 15 percent restocking fee.

	HiQ Pentium-75	Hi-Tech USA Pentium-75	MicroSmart Pentium-75
	$2275	$1893	$2080
	ISA/PCI	ISA/PCI/VLB	ISA/PCI
	8/128	8/128	8/256
	256/256	256/512	256/1024
	tower	minitower	minitower
	Maxtor 7850AV	Seagate ST3660A	Conner CFA850A
	850	545	852
	generic Trident PCI-47-based (PCI)	ATI Mach 32 (PCI)	generic Trident TVGA 8900D-based (ISA)
	1	1	1
	Hitachi Superscan 15s	KFC (Smile International)/CA-1511	CTX 1565GM
	15/13.75/.28	15/13.75/.28	15/14/.28
	U.S. Robotics/ 14.4/14.4	generic/ 14.14/14.4	Zoltrix/ 14.4/14.4
	Diamond Pro-16	Creative Labs Vibra 16	Creative Labs SB16 Value
	Toshiba/4X	Mitsumi/4X	Panasonic/2X
	Compton's Encyclopedia, Family Doctor, MegaRace, Myst, QuickLink II Fax, SimCity 2000, and 4 others	BitCom/BitFax DOS, Delrina 4-in-One	BitWare Lite
	1/2	1/1	5 [3]/lifetime
	●	● [6]	●
	○	○	○
	9	8.5	8.5
	●/●	○/●	●/●
	800/827-5836	800/831-2888	800/370-9090
	769	770	771

For more information about all products in this table, circle reader service no. 909.

The Costs of Low Prices

Despite their attractive prices, almost none of the systems came close to providing an overall value that would win them a spot on either our Budget or Power Top 20 charts—due largely to their middling performance. (The sole exception was the U.S. Logic system, whose adequate speed and sub-$2000 cost could have made it a contender for a position in the lower half of the budget chart.) We were also distressed by the fact that only three of the eight computers worked right out of the box, although our sampling was too small to tell us anything about the reliability of inexpensive PCs in general.

With those major caveats, among the brand-name systems we were impressed by the Gateway 2000's large bundle of top-notch software and nifty extras like a three-CD changer. The HiQ's high-quality components (some of which we specified and paid a premium for) helped it stand out among the hometown contenders, although it was the most expensive locally assembled system and didn't match the Gateway's assortment of software.

Overall, we'd have to give an edge to the brand-name systems we evaluated. On average, they were more expensive than the ones from local stores, but they were also faster and easier to set up. In addition, they tended to come with better software selections and larger hard disks, and their multimedia components were often of higher quality than those of the local PCs.

The locally assembled systems were generally rougher around the edges; they offered little printed or on-screen help to ease users through the setup process, and they gave us more difficulties like loose cables, malfunctioning components, and poorly packed cartons. For beginners, such quirks could be real problems, but these systems may hold some appeal for experienced users willing to risk such headaches in exchange for a rock-bottom price.

PC veterans with strong opinions about the wares of certain component manufacturers will also like local vendors' ability to custom-configure PCs with specific parts—something you usually can't do with big-name systems unless you buy them directly from the vendor through mail order. If you find a reliable local store, it's also possible to build a personal relationship with your computer supplier that's difficult to equal with a multimillion-dollar behemoth like Packard Bell or AST.

One other lesson that our experiences with these systems made clear: It's never wise to consider only the lowest-priced systems when shopping for a PC, even if that means you have to delay your purchase until you can afford costlier options. Whether you end up getting your PC from a top-tier manufacturer or a mom-and-pop storefront, the cheapest systems are rarely the best bargains.

Theresa W. Carey is a Palo Alto, California–based freelance writer. Harry McCracken is an associate editor for PC World. *Testing conducted by Dave Casini at the PC World Test Center.*

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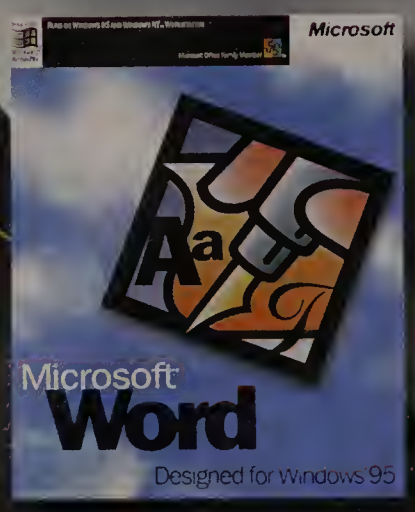

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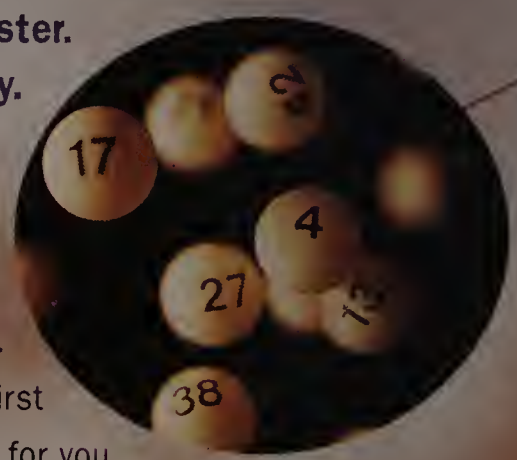

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Texas Instruments TravelMate 5000

Sharp PC-3010

TOP 20 PCs

The New Balance of Power

As prices drop, Pentium-133s challenge 120s and 100s as best value in power desktops. Our headliners this month: Dell's updated Dimension XPS P120c, Micron's 4100 Magnum, Texas Instruments' new TravelMate 5000, and Sharp's PC-3010.

THE TOP 20
PC WORLD
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Budget pg. 210
Notebooks pg. 216

BUYING A TOP POWER DESKTOP TODAY is like investing in soy futures—success depends on the timing. Purchase a system with the latest processor too soon, and you pay dearly for a relatively small increase in performance. Wait too long, and you start wondering if you should hold off for the next faster processor. What you're looking for is the sweet spot where the relative value of your new machine nears its peak.

By Rex Farrance and Melissa Riofrio

Dell Dimension XPS P120c

Micron 4100 Magnum

Prices have now dropped to the point where a P-133 is a short step up from a Pentium-120. The difference between similarly configured P-133s and P-120s is as little as $100, and one P-133 reviewed this month costs just $3199, yet the 133s are about 7 percent faster. One cause for the drop in price is wider availability. When P-133s first appeared, only a handful of the most prominent vendors had them. Now even local assemblers are advertising deals, and two new P-133s we review this month make our Top 20.

Of course, not everyone wants to pay for ultimate power: Prices of P-133s on our Top 20 run as high as $4299. P-100s remain fine business power values: The number three power desktop Dell Dimension XPS P100c costs just $3078 with a 17-inch monitor; Quantex's QP5/100 5M-1—a Top 20 power desktop reviewed in this issue—is only $2899. The number one Best Buy is still Dell's $3749 Dimension XPS P120c. Top 20 P-120 prices run from $3299 to $3799. Until something more powerful appears, P-133s, P-120s, and P-100s are the top values for users who need fast PCs. We wouldn't be surprised to see lead systems swap positions as prices fluctuate. Pentium-90s, on the other hand, are fading from the Power chart—even as they gain presence in the budget market. Three of the four remaining P-90s cost less than $3000. In the next few months, expect to see Pentium-90s exit our Power Desktops chart completely and assume a starring role on the Budget Top 20.

Budget Desktops Pack More Punch

Over half the systems on our Top 20 Budget Desktops chart this month are Pentiums, including four new additions. Although Pentium PCs are earning a reputation in the budget arena, DX4-100 CPUs from Intel and AMD are still prevalent among the lowest-cost machines. It's worth noting that the last Pentium-60s and 66s have disappeared from our charts.

New Notebooks on Top

Power notebook PCs are approaching the ideal of desktop replacement, with better displays and faster performance. Two of the least powerful notebooks in our power section feature DX4-75 CPUs, and three P-75s now appear on the chart. This month we review TI's new TravelMate 5000—a P-75 and our new number one power notebook. Budget notes maintain good prices while improving features. Almost all PCs on our chart now have color screens, and hard drives 340MB and larger have become common.

Speed, Value, and Longevity

Apart from first-time purchasers, the main reason people buy a new PC is to get the improved performance they need to handle new applications. When you consider the greater demands these new apps place on systems, it pays to buy the fastest unit you can afford. With prices on Pentium-133s starting to come down, it may be easier to convince yourself to buy one of the speediest PCs around.

Buying Smart: Consumer Tips

Your credit card can be a safety net.
Unless you already have a credit arrangement with the vendor, use a credit card to order all equipment. The credit card company can help mediate any disputes that arise or give you a refund if you fail to receive a product you've paid for.

Check money-back guarantees.
Read the fine print. Many guarantees impose important limitations not apparent from ads. You may be on the hook for shipping charges and restocking fees totaling hundreds of dollars.

Plan a RAM upgrade—get a faster CPU.
If your budget is tight, consider buying a PC with 8MB of RAM rather than 16MB. The $300 or so you save could buy you a faster processor or even a 17-inch monitor. Expanding RAM is an easy upgrade you can do later when you have the funds. Just make sure you can upgrade without having to discard installed RAM modules (SIMMs). Ask for high-capacity SIMMs in the PC you buy so sockets remain free for expansion. Also ask whether you can upgrade with just one SIMM at a time, or if you must add SIMMs in pairs or even four at a time. A good rule of thumb: Make sure you have enough free SIMM sockets to at least double your installed RAM.

Lithium ion batteries save you money.
Batteries are an important consideration when buying a notebook. While nickel–metal hydride (NiMH) batteries are most common, they aren't as good as the lithium ion packs of some newer models (see our Notebook PCs Top 20). With batteries of equal weight, lithium ion batteries accept a larger charge. And although they cost twice as much as NiMH units, they take more than three times as many charges before you have to buy a replacement, and they hold a charge better between uses. Finally, you can top them off with a fresh charge whenever convenient, without having to worry about draining the charge fully to avoid damaging the battery.

Rex Farrance is a senior associate editor and Melissa Riofrio an associate editor for PC World. *They can be reached on PC World Online (see page 12 for contact information).* PC World *staff members John Goddard, Andrew Hawn, Arden Hoffman, and Harry McCracken and freelance writer Jon L. Jacobi contributed to this article. Testing by Ulrike Diehlmann and Mike Salayko; research and support by Andrew Hawn.*

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THE TOP 20

PC WORLD

POWER DESKTOPS

1 **Dell Dimension XPS P120c**
One of the fastest P-120s.

	Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1 Dell Dimension XPS P120c	1	2	Sep 95	84	111	71/74	$3749	Pentium-120	16	1080
2 Dell Dimension XPS P133c	4	3	Aug 95	84	109	71/74	$3911	Pentium-133	16	1080
3 Dell Dimension XPS P100c	2	3	Aug 95	83	100	71/74	$3078	Pentium-100	16	1080
4 Dell Dimension XPS P90	3	2	Sep 95	83	93	71/74	$2649	Pentium-90	8	1080
5 Micron P133 Millennia	6	3	Aug 95	82	119	65/69	$4299	Pentium-133	16	1624
6 Micron P120 Millennia	5	5	June 95	81	111	65/69	$3299	Pentium-120	16	1278
7 Micron P100 Millennia	7	3	Aug 95	81	107	65/69	$2999	Pentium-100	16	1278
8 AT&T Globalyst 630	8	4	July 95	79	93	75/67	$3998	Pentium-100	16	1083
9 HP Vectra VL3 5/120	9	5	June 95	79	90	78/73	$3659	Pentium-120	16	850
10 Dell OptiPlex XMT 590	13	10	Jan 95	78	82	71/75	$2999	Pentium-90	16	1083
11 Gateway 2000 P5-133XL	11	3	Aug 95	78	120	58/61	$4229	Pentium-133	16	1624
12 Gateway 2000 P5-120XL	10	5	June 95	78	113	58/61	$3799	Pentium-120	16	1624
13 Micron P90 PowerStation	16	9	Feb 95	77	86	65/69	$2899	Pentium-90	16	1080
14 Dell OptiPlex XMT 5100	12	6	May 95	77	83	71/75	$3503	Pentium-100	16	1083
15 Digital Celebris XL 590	14	6	May 95	77	86	75/73	$4800	Pentium-90	16	1083
16 Zenon Dream Media P5-133	–	1	current	77	122	[2]	$3199	Pentium-133	16	1080
17 Gateway 2000 P5-100XL	15	5	June 95	77	111	58/61	$3399	Pentium-100	16	1083
18 PerComp P133 Professional	–	1	current	76	119	[2]	$4295	Pentium-133	16	1200
19 NEC Image P100E	19	2	Sep 95	76	94	64/71	$3849	Pentium-100	16	1083
20 Quantex QP5/100 SM-1	–	1	current	76	92	58/67	$2899	Pentium-100	16	1200

BEST BUY

[1] Call 800/434-4495 (for payment by Visa or MasterCard) or 900/903-2972 (for telephone billing) and use the fax reprint numbers listed above to order fax copies of system reviews. You can order three systems' capsule reviews ($4.95), a single capsule review plus features table and test report ($4.95), an entire month's review ($9.95), and a list of all systems tested by the PC World Test Center ($4.95). In addition, you can order next month's Top 20 charts and capsule reviews

2 **Dell Dimension XPS P133c**
Fine configuration, video.

3 **Dell Dimension XPS P100c**
Fast, big monitor, great price.

4 **Dell Dimension XPS P90**
Great price, fast.

5 **Micron P133 Millennia**
Ultrafast with 6X CD-ROM drive.

CD-ROM drive	Bus slots	Monitor size/ dot pitch	Vendor contact number	Fax reprint number [1]	Reader service no.	Comments (Recommended as home system)
4X	ISA, PCI	17"/.28	800/289-3355	3281	636	Reasonable price for fast performance, big monitor, and three-year parts warranty.
4X	ISA, PCI	17"/.28	800/289-3355	3266	637	Fine performance, reliability, and service, excellent configuration, MPEG software.
4X	ISA, PCI	17"/.28	800/289-3355	3265	638	Fast P-100 lacks optional sound, but it's priced right and backed by excellent support.
4X	ISA, PCI	17"/.28	800/289-3355	3282	639	Very affordable, fast P-90 with big monitor should be a magnet for business buyers.
6X	ISA, PCI	15"/.28	800/223-6571	3268	640	Very fast with a 6X CD-ROM drive, but monitor is small for a pricey PC.
4X	ISA, PCI	15"/.28	800/223-6571	3242	641	With excellent performance, this 120 makes a great alternative to the pricier 133s.
4X	ISA, PCI	15"/.28	800/223-6571	3267	642	Good price, great 100-MHz performance, and solid configuration make for a fine value.
4X	ISA, PCI	17"/.27	800/447-1124	3252	643	Swift desktop with a big monitor and nice telephony features.
4X	ISA, PCI	15"/.28	800/322-4722	3243	644	Slow for a Pentium-120 but still a solid deal—and HP's support is superb.
4X	ISA, PCI	15"/.28	800/289-3355	3173	645	Dell configures and tests this line of PCs for use on LANs in a corporate environment.
4X	ISA, PCI	17"/.25	800/846-2000	3269	646	Pricey P-133 is superfast, with a tempting configuration and a CD-ROM changer.
4X	ISA, PCI	17"/.25	800/846-2000	3244	647	Pricey, with outstanding performance, great configuration, and CD-ROM changer.
4X	ISA, PCI	15"/.28	800/223-6571	3184	648	Well-configured Pentium-90 with a long run on Top 20 is still a solid value.
4X	ISA, PCI	15"/.28	800/289-3355	3222	649	Corporate PC aimed for use in LAN environments has better warranty than Dimensions.
4X	ISA, PCI	17"/.26	800/642-4532	3223	650	Fine Pentium-90 performance, large monitor, high price on corporate PC from big vendor.
4X	ISA, PCI	15"/.28	800/899-6119	3291	651	Fast-performing P-133 has a very tempting price but a small monitor.
4X	ISA, PCI	17"/.25	800/846-2000	3245	652	Fastest Pentium-100 we've ever tested comes with a solid configuration.
6X	ISA, PCI	17"/.26	800/856-6688	3292	653	Great performance, fine configuration, a 6X CD-ROM drive, and a high price.
4X	EISA, PCI	15"/.28	800/632-4636	3283	654	Strong overall package, your first choice if you want to add EISA cards and a second CPU.
4X	ISA, PCI	17"/.26	800/896-4898	3293	655	Attractive price for business buyers on good configuration.

in advance (The Top 20 Flash Report, $9.95; available September 27). Touch-tone phone required. [2] Insufficient customer responses to our Reliability and Service Monitor to gauge service performance and reliability. For our overall evaluation, we use an average rating derived from all companies for which we have received fewer than 100 responses.

For more information about all products in this table, circle reader service no. 904.

Top 20 Power Desktops

THE BALANCE OF POWER IS SHIFTING TO Pentium-133s in this chart—they now outnumber the P-120s. For overall value, however, 100-MHz Pentiums still dominate, with seven on the Top 20.

Dell maintains its lead. Our number one system is still Dell's Dimension XPS P120c. But thanks to a price drop of almost $200, the Dimension XPS P133c is now number two (up from number four last month). And the Dimension XPS P100c and P90 models stay close in third and fourth place.

Micron's high-level lineup has also undergone a reshuffling. The $4299 P133 Millennia, last month's sixth-place system, has moved up to fifth place, while the more lightly configured $3299 P120 Millennia has dropped to sixth position, followed by the $2999 P100 Millennia.

The latest Pentium-133s to reach our Power Desktops Top 20 are the spectacularly fast Zenon Dream Media P5-133 and PerComp P133 Professional, both reviewed in this issue. PerComp's P133 costs just $100 more than the company's identically configured P120. The P133 made our chart; the P120 just missed. The difference? The P133 delivers about a 6 percent improvement in performance. That's a very cost-effective upgrade for just $100.

1 Dell Dimension XPS P120c

REVIEWED: September 1995

PROS: Great performance, multimedia, video-accelerated graphics card, 512K of secondary cache, 28.8-kbps fax-modem, three-year warranty on parts

CONS: On/off button can be mistaken for floppy eject button

This new and improved $3749 system is more than $900 cheaper than the original Pentium-120 unit it replaces. It includes Intel's Pentium-optimized Triton PCI chip set, 16MB of Extended Data Output (EDO) RAM, 512K of pipeline-burst secondary cache, and a 1080MB hard drive. With performance that rivals that of many P-133s, it's one of the fastest P-120s we've seen. Like the Dell P133c and P100c Best Buys, this PC has a 2MB Number Nine 9FX Motion graphics controller that supports software MPEG and full-motion video. Readers responding to our ongoing fax-back survey continue to give Dell high marks for service and reliability.

2 Dell Dimension XPS P133c

REVIEWED: August 1995

PROS: Super quick, 17-inch monitor, graphics controller with software MPEG support

CONS: On/off button easy to confuse with floppy eject button

A price drop of almost $200—to $3911—raises this system a couple of notches on the Power chart, vaulting it past its 100-MHz and 90-MHz Pentium siblings. As with the other Dimensions, the price now includes a three-year warranty (one year for labor), backed by Dell's excellent support and fine reliability. The solid configuration includes 16MB of EDO RAM, a generous 512K of pipeline-burst secondary cache, a Sound Blaster AWE32 wave-table sound card, a 17-inch monitor the aforementioned Number Nine 9FX Motion graphics controller, and a 1080MB hard drive.

3 Dell Dimension XPS P100c

REVIEWED: August 1995

PROS: Excellent performance, 17-inch monitor, top-notch service, full-motion video

CONS: On/off button looks dangerously like a floppy eject button

This $3078 Dell maintains a very high ranking, thanks in part to a $100 price reduction and the Dimension line's new longer warranty. The XPS P100c also features 16MB of EDO RAM, 256K of pipeline-burst secondary cache, a quad-speed CD-ROM drive, a fast 1080MB hard drive, and great video—but no sound card or speakers. As configured, this unit would make a terrific business power box in a situation where sound features aren't required.

4 Dell Dimension XPS P90

REVIEWED: September 1995

PROS: Top performance for a Pentium-90, great service and reliability, good basic features

CONS: 8MB of RAM is sparse for a Pentium desktop these days; the on/off switch looks deceptively like a floppy eject button

This is the third Dimension XPS P90 we've seen, but it's the first to include Intel's optimized Triton PCI chip set, and Dell recently added EDO RAM and pipeline-burst cache to boost performance even more. The company made some concessions to keep the price low, providing only 8MB of RAM and an adequate but unexciting Number Nine #9GXE graphics controller, but you can't argue with the rest of the $2649 package, especially the 17-inch monitor and quad-speed CD-ROM drive.

5 Micron P133 Millennia

REVIEWED: August 1995

PROS: One of the two fastest machines we've ever tested, huge hard drive, fast CD-ROM drive

CONS: One-year warranty, high price

This blazing Pentium-133 system has 16MB of EDO RAM and 256K of Micron's speedy SyncBurst secondary cache. The $4299 price, although $100 lower than last month, is still high, especially for a system with a basic 15-inch monitor. But it buys you a minitower with a big 1624MB Western Digital Caviar Mode 4 PIO hard drive, a 6X Plextor SCSI CD-ROM drive, and Microsoft Office Pro and Bookshelf. Micron's reputation for good service is well deserved.

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6 Micron P120 Millennia

REVIEWED: June 1995

PROS: Lightning fast, excellent expandability, good support rating, 1278MB hard drive

CONS: One-year warranty is minimal by today's standards

7 Micron P100 Millennia

REVIEWED: August 1995

PROS: Competitive $2999 price, fast Pentium-100 performance, 1278MB hard drive

CONS: The system's one-year warranty is lean by today's standards

8 AT&T Globalyst 630

REVIEWED: July 1995

PROS: Lots of room to add components, excellent reliability record, 17-inch monitor, bundled teleconferencing and alphanumeric paging applications

CONS: Poor documentation, $3998 price a bit high for a Pentium-100 PC

9 HP Vectra VL3 5/120

REVIEWED: June 1995

PROS: Good price for a Pentium-120, excellent design, one of the best records in the business for service and reliability

CONS: Relatively sluggish, performs more like a Pentium-100

10 Dell OptiPlex XMT 590

REVIEWED: January 1995

PROS: Quick Pentium-90 performance, 1083MB hard drive, three-year warranty

CONS: One-week turnaround time for repairs not as prompt as most

11 Gateway 2000 P5-133XL

REVIEWED: August 1995

PROS: Rocket fast, 1624MB hard drive, 17-inch monitor

CONS: A bit pricey at $4229, sparse documentation, no set turnaround time for repairs

12 Gateway 2000 P5-120XL

REVIEWED: June 1995

PROS: Extremely fast, 1624MB hard drive, 17-inch monitor

CONS: Sparse documentation, no set turnaround time for repairs

13 Micron P90 PowerStation

REVIEWED: February 1995

PROS: Fast Pentium-90 performance, 1080MB hard drive, good service and reliability records

CONS: One-year warranty is minimal these days

14 Dell OptiPlex XMT 5100

REVIEWED: May 1995

PROS: Plenty of free slots and drive bays, 1083MB hard drive, three-year warranty

CONS: Seven-day turnaround time for repairs is longer than average

15 Digital Celebris XL 590

REVIEWED: May 1995

PROS: Speedy, accepts a second CPU, excellent reliability and service ratings, 17-inch monitor

CONS: Very expensive for a Pentium-90 without full multimedia

16 Zenon Dream Media P5-133

NEW THIS MONTH

PROS: Fast and inexpensive

CONS: Short warranty

Would you believe a fast, loaded Pentium-133 system for only $3199? This system is not only the lowest-priced 133-MHz PC we've seen, it's also the fastest. And for a system with this low a price, it provides a surprisingly generous configuration. The system's 16MB of fast EDO RAM and 256K of burst-mode secondary cache contribute to its chart-topping performance, and you also get a fast 1080MB Quantum Fireball Mode 4 PIO hard drive.

Zenon

Zenon didn't stop at performance enhancements. This inexpensive tower computer is stocked with a complete set of multimedia components, making it a good choice for the home or office. For example, there's a quad-speed Pioneer CD-ROM drive, a Creative Labs Sound Blaster AWE32 sound card, a microphone, and speakers. The included 14.4-kbps fax-modem comes with Bitfax and Bitcom communications software, and you also get Microsoft's Encarta, Home CD-Sampler, Works, and Multimedia Space Explorer as part of Zenon's impressive software bundle. The excellent Diamond Stealth 64 PCI graphics controller with 2MB of VRAM produces resolutions up to 1600 by 1200—more than you need for the 15-inch Mag DX15E monitor with its 14.2-inch–diagonal viewable screen.

Drive expandability is good, with three externally accessible drive bays free. That should be sufficient to handle a tape backup drive and any other removable-media storage devices you are likely to want to add. On the other hand, the system doesn't have a lot of free expansion slots. You get two free PCI slots plus one free slot that accepts either an ISA or a PCI card. Fortunately, most of the ISA peripherals you're apt to need are already installed. But the addition of, say, a tape accelerator card will use up your one free ISA slot. And in most cases, it will be ISA cards rather than PCI peripherals you'll want to add in.

Zenon's standard warranty runs for just one year—minimal coverage in today's market. You do get a 30-day money-back guarantee, and a year of on-site service costs only $50. And Zenon's three-day turnaround policy on factory repairs is solid. Toll-free tech support is available 12 hours on business days, and the company also offers Saturday hours. Buyers of power systems in particular are justifiably picky about support issues, and consequently they tend to turn to the bigger vendors. Still, this system has a lot to offer. With its superb performance, sound configuration, and eminently reasonable price, it's bound to rouse buyers' interest.

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*PC Magazine, Nov. 22, 1994. Annual Printer Review.

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17 Gateway 2000 P5-100XL

REVIEWED: June 1995

PROS: Fastest Pentium-100 system we've tested, quad-speed CD-ROM drive

CONS: No free SIMM sockets, sparse documentation, no set turnaround time for repairs

18 PerComp P133 Professional

NEW THIS MONTH

PROS: Superb performance, high-quality multimedia components, three-year warranty, 24-hour technical support, SCSI-2 port

CONS: No free SIMM sockets, only two free drive bays, high price

If you're thinking about buying a Pentium-133 system, it's a safe bet you want top-notch performance—and that's just what PerComp's P133 Professional provides, running neck and neck in our tests with the fastest Pentium-133 PCs. And this $4295 minitower has the topflight configuration every Pentium-133 buyer expects. With 16MB of RAM, a 1200MB hard drive, a SCSI-2 port, a high-quality Diamond Stealth 64 PCI graphics adapter with 2MB of fast VRAM, and a PerComp 17-inch monitor with a large 16-inch–diagonal viewable screen, the P133 Professional is very well equipped to run graphical applications. Its multimedia components, including a classy Plextor 6X CD-ROM drive and an Ensoniq Soundscape wave-table sound card, are excellent. And where many vendors cut corners on speakers, PerComp gives you nice Sony stereo units with 3-D sound and an 11-watt subwoofer for booming bass. In addition, PerComp's application bundle includes Lotus SmartSuite 3.1 on CD-ROM.

PerComp P133

Our reservations about the P133 primarily concern its less-than-ideal expandability. For example, our unit's four SIMM sockets came filled with 4MB SIMMs. Unlike 486 and DX4 systems, Pentium computers require SIMMs to be installed in pairs. So you must think ahead when you purchase a PC to assure maximum expandability down the road. While 16MB of RAM may seem like quite a lot to you now, don't be surprised if application developments push memory requirements to a point where you'll need more RAM to work efficiently. We suggest that if you buy this model, you insist that PerComp install two 8MB SIMMs, leaving you room to upgrade later on without having to discard RAM you've already paid for. Reflecting the general lack of expandability, the minitower case has just one free 5¼-inch and one free 3½-inch bay; fortunately, both are externally accessible. They should suffice for most users, but if you install a tape backup drive and, say, a second hard drive, any additional storage devices will have to be pricey external units.

Like many systems that are assembled, rather than designed from the ground up, the P133 lacks cohesive documentation. The collection of manuals from the components' manufacturers is adequate for experienced users, but integrated documentation would be much easier to use. Support policies are excellent, from the three-year warranty to round-the-clock toll-free tech support.

PerComp also sells this PC in a 120-MHz version (see this issue's System Snapshots), but if you're investing more than $4000 in a system, it would be foolish not to spend the extra $100 and get the added boost of the Pentium-133, which tested about 6 percent faster than its 120-MHz sibling.

19 NEC Image P100E

REVIEWED: September 1995

PROS: Powerful system with second CPU socket and on-board SCSI support

CONS: Could use a higher-powered graphics adapter

20 Quantex QP5/100 SM-1

NEW THIS MONTH

PROS: Strong performance, good price for a Pentium-100

CONS: Minimal one-year warranty

The QPS/100 SM-1 helps demonstrate why Quantex has a reputation as a price leader. For $2899, you get a lot of PC, including a Pentium-100 processor, 16MB of RAM, 256K of secondary cache, a 1200MB hard drive, and a nice 17-inch Mag DX17F monitor with a 15.9-inch–diagonal viewable display. And unlike many other Quantex machines that we've seen lately (including a nearly identical system reviewed in August), this computer is quite a good performer in its CPU class.

As usual, Quantex doesn't skimp on components. You get a 64-bit ATI Graphics Xpression graphics adapter with 2MB of DRAM, which matches up very well with the big monitor. In addition, this midsize tower houses a high-quality Toshiba XM-5302B quad-speed Enhanced-IDE CD-ROM drive and a 16-bit sound card (the stereo speakers are external). And to handle your communications needs, Quantex throws in a speedy fax-modem that transmits data at 28.8 kbps and faxes at 14.4 kbps. Bundled software includes WordPerfect's Perfect Office, the Everywhere USA Travel Guide, and Quicken Special Edition.

The QPS/100 SM-1 gives you an imposing amount of drive expandability, with seven free bays (three externally accessible). The number of free slots is much less impressive, but it should be adequate for most users: You get one free ISA slot, one free PCI slot, and another free slot that accepts either a PCI or an ISA card.

Quantex

With all that this PC has to offer, you may wonder why it doesn't rate even higher. Quantex's support doesn't rank near the top, and the company's policies can't compare with the three-year warranties and the 24-hour technical support that you get from the bigger vendors. The standard warranty runs for a minimal one year. Fortunately, a year of on-site service is also included. Technical support is available 11 hours a day Monday through Thursday and 9 hours a day on Friday and Saturday. Although readers rate Quantex service as good on *PC World*'s ongoing fax-back survey, the poor rating they give on reliability lowers the ranking of this otherwise attractive system.

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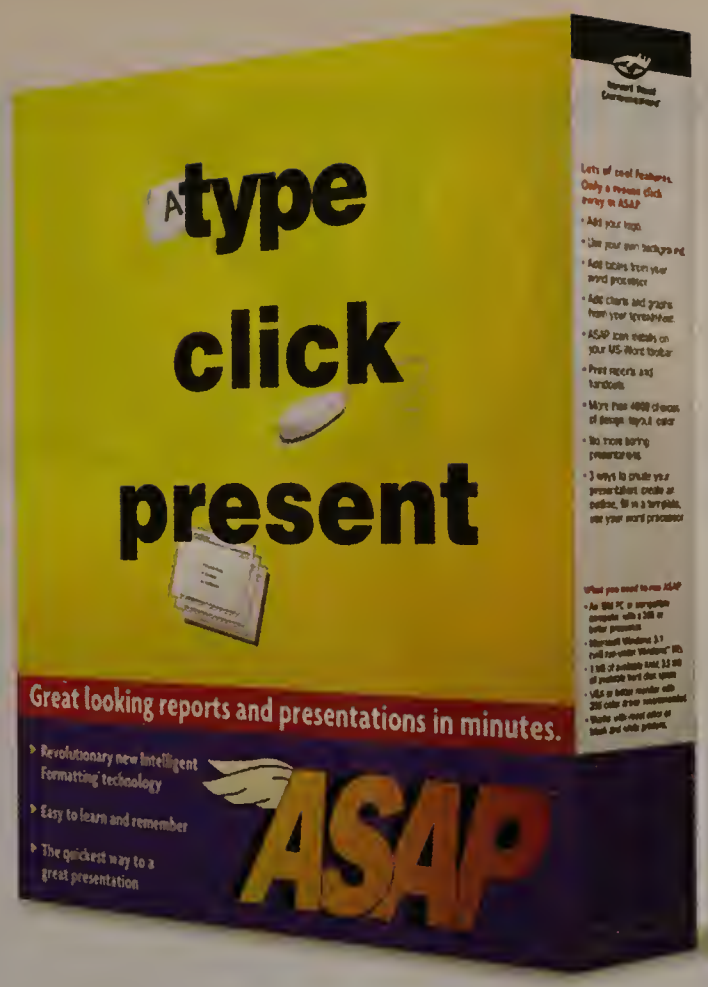

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THE TOP 20

PC WORLD

BUDGET DESKTOPS

1 **Micron 4100 Magnum**
A multimedia-ready winner.

	Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1 Micron 4100 Magnum	1	3	Aug 95	78	70	65/69	$1999	DX4-100	8	1278
2 Vektron PCI P-75	2	4	July 95	76	74	[2]	$1695	Pentium-75	8	852
3 DTK Quin-35M/75	3	3	Aug 95	76	70	62/58	$1875	Pentium-75	8	1083
4 Dell Dimension XPS P75	8	6	Mar 95	76	62	71/74	$2038	Pentium-75	8	545
5 Micron P90 Home MPC	4	3	Aug 95	75	74	65/69	$2198	Pentium-90	8	541
6 HiQ Mars Station	7	3	Aug 95	75	60	[2]	$1530	AmDX4-100	8	540
7 Polywell Poly 486-80VB	5	9	Feb 95	75	63	[2]	$1585	Am486DX2-80	8	540
8 PerComp 4100VIP	10	4	July 95	75	60	[2]	$1814	AmDX4-100	8	850
9 Blackship P-75 Neptune	–	1	current	74	67	[2]	$1795	Pentium-75	8	541
10 Micro Express MicroFlex-PCI/P902	–	1	current	74	86	[2]	$1949	Pentium-90	8	541
11 Quantex QP5/75 XM-1	6	2	Sep 95	74	65	58/67	$1975	Pentium-75	8	850
12 Netis N575	–	1	current	74	76	[2]	$2015	Pentium-75	16	1278
13 Diamond DX4-100	29	3	May 95	73	56	[2]	$1835	AmDX4-100	16	540
14 Intelesys Star 75	11	3	May 95	73	67	[2]	$1974	Pentium-75	8	850
15 Polywell Poly DX4-100	65	1	Apr 95	73	69	[2]	$1936	DX4-100	8	540
16 Micro Express MicroFlex-VL/80	12	8	Mar 95	73	57	[2]	$1499	Am486DX2-80	8	540
17 Blackship P-90 Neptune	–	1	current	73	65	[2]	$1995	Pentium-90	8	854
18 MIS Multimedia DX4-100	20	2	Sep 95	72	64	[2]	$1995	DX4-100	16	732
19 CompuTrend Premio P75	26	2	July 95	72	65	[2]	$1999	Pentium-75	16	1083
20 Austin Premier PCI DX4-100	25	2	July 95	72	63	[2]	$1999	DX4-100	8	732

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2 **Vektron PCI P-75**
Fast, expandable bargain.

3 **DTK Quin-35M/75**
Good all-around PC, big hard drive.

4 **Dell Dimension XPS P75**
Solid PC has excellent support.

5 **Micron P90 Home MPC**
Multimedia-ready P-90.

CD-ROM drive	Bus slots	Monitor size/ dot pitch	Vendor contact number	Fax reprint number [1]	Reader service no.	Comments (Recommended as home system)
4X	ISA, PCI	15"/.28	800/223-6571	3273	656	Three-time budget monarch has full multimedia configuration, fine DX4-100 performance.
–	ISA, PCI	15"/.28	800/725-0026	3257	657	Great price for fast Pentium-75 desktop, but no CD-ROM drive or sound.
4X	ISA, PCI	15"/.28	800/289-2385	3274	658	Good Pentium-75 performance, attractive price on tower unit.
4X	ISA, PCI	15"/.28	800/289-3355	3229	659	Budget unit from reliable Dell comes multimedia ready.
4X	ISA, PCI	15"/.28	800/223-6571	3275	660	Our only Pentium-90 budget Best Buy comes with a full multimedia configuration.
2X	ISA , PCI	15"/.28	800/827-5836	3277	661	Makes its mark with an ultralow price for an entry-level configuration.
4X	ISA, VLB	14"/.28	800/999-1278	3194	662	Nimble DX2-80 with small monitor is a reasonably priced business starter box.
4X	ISA, PCI	15"/.28	800/856-6688	3260	663	Solid multimedia-configured DX4-100 at an attractive price.
4X	ISA, PCI	15"/.28	800/531-7447	3294	664	Aggressive price boosts multimedia box onto chart despite badly cluttered interior.
4X	ISA, PCI	15"/.28	800/989-9900	3295	665	Attractive price on quick Pentium-90 with small hard drive and no multimedia components.
4X	ISA, PCI	15"/.28	800/896-4898	3284	666	Good P-75 multimedia system for under $2000.
–	ISA, PCI	15"/.28	800/577-7526	3296	667	Quick Pentium-75 has lots of RAM and a generous hard drive but no multimedia components.
4X	ISA, PCI	15"/.28	800/989-7253	3233	668	Slowest machine on the chart; fine price for a multimedia-configured AmDX4-100.
4X	ISA, PCI	15"/.28	800/577-2486	3276	669	Multimedia tower with a fax-modem for under $2000.
4X	ISA, PCI	15"/.28	800/999-1278	3297	670	Price drop moves multimedia minitower onto chart—big CD-ROM bundle.
–	ISA, VLB	15"/.28	800/989-9900	3208	671	Sparsely configured DX2-80 can't keep up with the DX4s, but look at that price!
4X	ISA, PCI	15"/.28	800/531-7447	3298	672	Cheap for a P-90, but don't let the processor fool you; many P-75s are faster.
4X	ISA, VLB	15"/.28	800/733-9188	3290	673	Solid, balanced multimedia box, but no one feature stands out.
–	ISA, PCI	15"/.28	800/677-6477	3263	674	Lots of RAM and hard disk space—but no multimedia components.
4X	ISA, PCI	14"/.28	800/331-1501	3262	675	Nice basic multimedia box, but the monitor's too small.

advance (The Top 20 Flash Report, $9.95; available September 27). Touch-tone phone required. [2] Insufficient customer responses to our Reliability and Service Monitor to gauge service performance and reliability. For our overall evaluation, we use an average rating derived from all companies for which we have received fewer than 100 responses.

For more information about all products in this table, circle reader service no. 905.

Top 20 Budget Desktops

THIS MONTH'S BUDGET DESKTOPS CHART FEAtures four new systems—two Pentium-90s and two Pentium-75s. Over half of the Budget Top 20 PCs, including four of the Best Buys, are now Pentiums.

Systems equipped with Intel and AMD DX4-100 CPUs are still big players in the under-$2000 category. Aside from their affordability, they provide excellent performance, typically just a step below that of Pentium-75 PCs. Two Am486DX2-80s—both bargains that are priced under $1600—also appear in this month's economy-class lineup.

1 Micron 4100 Magnum

REVIEWED: August 1995

PROS: Very fast for a DX4-100 desktop, 1278MB hard drive, solid multimedia configuration

CONS: One-year warranty, 32MB RAM limit

The $1999 4100 Magnum remains number one for a third straight month. The solid configuration is marred only by the low RAM ceiling. Despite a short warranty, service and reliability rate high.

2 Vektron PCI P-75

REVIEWED: July 1995

PROS: One of the cheapest Pentium-75 PCs you can buy, one of the fastest budget PCs on chart

CONS: Short one-year warranty, tech support available only during business hours

For just $1695, you get a lot of bang for the buck and excellent expandability. Weaknesses? The PC's lack of multimedia equipment, a brief one-year warranty, and limited tech-support hours.

3 DTK Quin-35M/75

REVIEWED: August 1995

PROS: Solid Pentium-75 performance, good price, 1083MB hard drive

CONS: No money-back guarantee (system replacement only), cluttered motherboard

This $1875 system from DTK offers a big hard drive, a 2MB PCI graphics adapter, and a CD-ROM drive. There's some internal clutter, with cables hindering access to the two free PCI slots.

4 Dell Dimension XPS P75

REVIEWED: March 1995

PROS: Good basic multimedia configuration, great reliability and service

CONS: Fairly small 545MB hard drive, graphics controller has just 1MB of RAM

A price drop to $2038 returns this system to Best Buy status. Performance was sluggish in our tests, but Dell claims the current unit is faster. You get rock-solid reliability and a three-year warranty.

5 Micron P90 Home MPC

REVIEWED: August 1995

PROS: One of the fastest budget PCs you can buy, strong multimedia configuration, affordable

CONS: Short one-year warranty, small 541MB hard drive

For $2198, you get just 8MB of RAM and a small hard drive. But fine performance, a 2MB Diamond Stealth 64 card, and a 14.4-kbps U.S. Robotics fax-modem help make this P-90 a Best Buy.

6 HiQ Mars Station

REVIEWED: August 1995

PROS: Very attractive $1530 price for an AmDX4-100 system

CONS: One-year parts warranty, only one free SIMM socket

7 Polywell Poly 486-80VB

REVIEWED: February 1995

PROS: Am486DX2-80 PC offers performance similar to a DX4-100's at an enticing price

CONS: Cramped 14-inch monitor

8 PerComp 4100VIP

REVIEWED: July 1995

PROS: Above-average support policies, good multimedia PC for a reasonable $1814 price

CONS: Awkward on-screen monitor controls, only 1MB of DRAM on graphics controller

9 Blackship P-75 Neptune

NEW THIS MONTH

PROS: Low price, multimedia configuration, 14.4-kbps fax-modem

CONS: So-so Pentium 75 performance, short parts warranty, cluttered interior

It's hard to find multimedia-configured Pentium-75s as cheap as Blackship's $1795 P-75 Neptune. This compact comes bundled with Microsoft's Dangerous Creatures, Encarta, Golf, and Works. The 8MB of RAM and 541MB hard drive are budget basics, but you get a 14.4-kbps U.S. Robotics fax-modem, a 2MB 64-bit STB graphics adapter, and a 15-inch ADI MicroScan 4GP display (13.6-inch–diagonal viewable screen).

Blackship P-75

There are two free drive bays (one externally accessible), one free ISA slot, one free PCI slot, and one free ISA or PCI slot. Technical support is available weekdays only. Blackship has a short one-year parts warranty, but labor is free for three years, with a year of on-site service.

The internal clutter shows Blackship's typical disregard for good fit and finish. Unruly ribbon cables impede access to the free memory sockets , and the close quarters make it difficult to install add-in cards. Most significant, the Neptune is not an impressive P-75 performer, despite its solid 256K of secondary cache and Pentium-optimized Intel Triton chip set. Still, the Neptune does provide entry-level Pentium performance at a price that's hard to resist.

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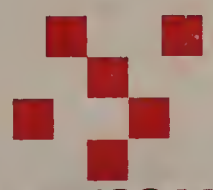

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10 Micro Express MicroFlex-PCI/P902

NEW THIS MONTH

PROS: Fast Pentium-90 performance, inexpensive

CONS: No sound to complement the quad-speed CD-ROM drive, entry-level 541MB hard drive

The first thing value-conscious buyers should check is a system's price/performance ratio, and here this very expandable PC shines, with fine P-90 performance for just $1949. An Intel Triton chip set and Toshiba 4X CD-ROM drive enhance a vanilla budget minitower that has 8MB of RAM, a 541MB hard drive, a GVC 15-inch display, and a 2MB graphics adapter.

Micro Express PCI/P902

Documentation relies on manuals provided by manufacturers of the various components. You get a two-year warranty and a year of on-site service. Tech support is available 24 hours a day, but nights and weekends you must make a toll call, leave a number, and wait for a callback. If fast performance at a low price is what you're looking for, this economy Pentium-90 just might punch your ticket.

11 Quantex QP5/75 XM-1

REVIEWED: September 1995

PROS: Full multimedia setup and a good software bundle for less than $2000

CONS: One-year warranty, shaky reliability, few open slots on motherboard

12 Netis N575

NEW THIS MONTH

PROS: Excellent price, outstanding Pentium-75 performance, generous RAM, large hard drive

CONS: Short parts warranty, no CD-ROM drive or sound

If you're looking for a fast economy box—and you don't need multimedia components—this $2015 Pentium-75 tower's price/performance combo is hard to beat. You get 16MB of RAM, a big 1278MB hard drive, a Diamond Stealth 64 card with 2MB of DRAM, and a nonprogrammable 15-inch Sampo AlphaScan monitor.

Netis

Documentation explains the individual components capably, but it does not include an overall system manual or a setup guide. The warranty covers parts for one year and labor for three, and an optional year of on-site service will cost you $70 extra. Technical support is available for 10 hours on weekdays and 6 hours on Saturdays. Most buyers expect the multimedia perks these days, but if you don't, this PC is a very attractive value.

13 Diamond DX4-100

REVIEWED: May 1995

PROS: Great price for an AmDX4-100 multimedia PC

CONS: Sparse documentation, 15-month parts warranty, fairly slow

14 Intelesys Star 75

REVIEWED: May 1995

PROS: Low $1974 price, 850MB hard drive, quad-speed CD-ROM drive

CONS: Cluttered interior makes adding cards a bit difficult

15 Polywell Poly DX4-100

REVIEWED: April 1995

PROS: Low price buys good DX4-100 performance, multimedia configuration includes 15 CDs

CONS: Some internal cable clutter

16 Micro Express MicroFlex-VL/80

REVIEWED: March 1995

PROS: Am486DX2-80 system has very good performance for just $1499, good expandability

CONS: Cluttered interior, fairly small 540MB hard drive, manuals overly technical

17 Blackship P-90 Neptune

NEW THIS MONTH

PROS: Low price, multimedia configuration, 14.4-kbps fax-modem

CONS: Poor Pentium-90 performance, short parts warranty, cluttered interior

Blackship P-90

Blackship claims a second spot on this month's Budget Desktops Top 20 with another inexpensive multimedia-ready Pentium PC. In this case the system is a $1995 P-90 with an 850MB hard drive. Except for the processor and hard disk, this P-90 Neptune and the P-75 Neptune in ninth place are identical. When it comes to performance, however, the P-90 rates about the same as its P-75 sibling, so much of the $200 extra you pay for the Pentium-90 will buy only ego gratification. That's why this unit falls so much lower on the chart.

18 MIS Multimedia DX4-100

REVIEWED: September 1995

PROS: Fast system for the money, multimedia configuration

CONS: Only one free VL bus slot, short one-year warranty

19 CompuTrend Premio P75

REVIEWED: July 1995

PROS: Low cost, 1083MB hard drive

CONS: A little slow for a Pentium-75, minimal service-and-support policies

20 Austin Premier PCI DX4-100

REVIEWED: July 1995

PROS: Great price for a reasonably fast multimedia PC

CONS: Small monitor, substandard manuals, no free SIMM sockets

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THE PC WORLD TOP 20

NOTEBOOK PCs

1 Texas Instruments TravelMate 5000
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POWER SYSTEMS

		Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1	Texas Instruments TravelMate 5000	–	1	current	102	58	[3]	$4799	Pentium-75	8	810
2	Toshiba T4900CT	1	8	Mar 95	97	54	80/74	$5899	Pentium-75	8	810
3	AST Ascentia 910N	2	7	Apr 95	96	42	[3]	$3856	DX4-75	8	510
4	Compaq LTE Elite 4/75 CXL	5	3	Aug 95	96	38	83/82	$4599	DX4-75	8	810
5	Gateway 2000 Liberty DX4-100	3	4	July 95	95	54	[3]	$2999	DX4-100	8	352
6	Gateway 2000 ColorBook2 DX4-100	4	3	Aug 95	95	58	[3]	$4400	DX4-100	24	720
7	Dell Latitude XP 4100CX	7	7	Apr 95	94	42	[3]	$3599	DX4-100	8	340
8	Toshiba Satellite Pro T2150CDT	8	4	July 95	93	48	[3]	$5199	DX4-75	8	500
9	IBM ThinkPad 755CD	18	2	Apr 95	93	46	78/77	$5649	DX4-100	8	540
10	NEC Versa P/75HC	13	2	June 95	92	64	[3]	$5100	Pentium-75	8	540

BUDGET SYSTEMS

1	Sharp PC-3010	3	2	Sep 95	90	33	[3]	$1899	Cx486DX2-66	8	324
2	MPC TouchNote 700	1	4	July 95	90	33	[3]	$2275	DX4-75	8	528
3	Austin Business Audio 4/75	4	9	Feb 95	89	36	[3]	$2256	DX4-75	8	340
4	CTX EzBook DX4/75	5	2	Sep 95	88	36	[3]	$2398	DX4-75	8	340
5	WinBook XPC	–	1	current	88	30	[3]	$2679	486DX2-50	16	351
6	Acom Patriot 4000 DX4-100	2	6	May 95	87	45	[3]	$2370	DX4-100	8	520
7	Acom Patriot 4000 DX2-66	6	8	Mar 95	86	35	[3]	$2030	486DX2-66	8	344
8	AMS SoundPro DX4-75	8	2	July 95	86	42	[3]	$2668	DX4-75	8	340
9	ZDS Z-Star EX	10	2	May 95	84	30	[3]	$2408	486DX2-50	8	200
10	ArmNote TS30M	11	4	Mar 95	84	26	[3]	$1632	486DX2-50	8	260

BEST BUY

[1] CA = color active, CD = color dual-scan, CP = color passive, MP = monochrome passive [2] Call 800/434-4495 (for payment by Visa or MasterCard) or 900/903-2972 (for telephone billing) and use the fax reprint numbers listed above to order fax copies of system reviews. You can order three systems' capsule reviews ($4.95), a single capsule review plus features table and test report ($4.95), an entire month's review ($9.95), and a list of all systems tested by the PC World Test Center ($4.95). In addition, you

2 **Toshiba T4900CT**
Classy P-75 has great support.

1 **Sharp PC-3010**
Extra-nice price.

2 **MPC TouchNote 700**
A well-balanced value.

Weight (pounds)	Battery life (hours)	Screen type/ size [1]	Vendor contact number	Fax reprint number [2]	Reader service no.	Comments
6.4	5:47	CA/10.3"	800/848-3927	3710	676	Quick and light with great performance, an excellent screen, and outstanding battery life.
7.6	3:57	CA/10.4"	800/334-3445	3677	677	TI's price advantage pushes this terrific, well-supported Toshiba into second place.
7	7:55	CA/10.4"	800/876-4278	3683	678	Excellent business traveler with three-year warranty, great battery life, reasonable price.
7.2	7:15	CA/10.3"	800/345-1518	3704	679	Slowest power note on chart has big hard drive, super battery, fantastic support.
6.6	6:47	CD/10.4"	800/846-2000	3700	680	Solid dual-scan color model with excellent performance, light weight, and fine battery.
6.8	5:16	CP/10.3"	800/846-2000	3703	681	Great performance on passive color model with big hard drive and maxed-out RAM.
7.4	6:46	CA/9.5"	800/289-3355	3685	682	Excellent, well-designed package; reasonable price, durable lithium ion battery.
8.8	5:20	CA/10.4"	800/334-3445	3701	683	Heavy multimedia notebook with CD-ROM drive, 16-bit sound, and 65,536-color screen.
8.6	3:11	CA/10.5"	800/426-2968	3688	—	Heavy IBM has sound and CD-ROM drive; Black Matrix screen viewable in bright light.
8.8	3:26	CA/9.5"	800/632-4636	3698	684	Fast, heavy high-class Pentium note has one of the first 800 by 600 screens.
7.2	5:14	CD/10.4"	800/237-4277	3705	685	Price drop of $200 pushes this light Cyrix DX2-66 note up to the top.
7.6	4:53	CD/9.4"	800/672-9919	3702	686	Good balance of speed, solid battery life, ample hard drive from DX4-75 budget note.
8.2	3:57	CD/9.5"	800/331-1501	3676	687	Color dual-scan notebook has nice audio features and a great price.
7.6	5:49	CP/10.3"	800/289-8808	3706	688	Solid performer with a large screen and outstanding battery life.
7.2	5:28	CD/10.3"	800/468-2162	3711	689	Lone WinBook Top 20 notebook has a a color screen and solid balance of features.
8.4	2:47	CD/10.3"	800/898-2665	3694	690	Fastest budget notebook has a reasonable price, but it's heavy and battery life is short.
8.4	3:30	CP/10.3"	800/898-2665	3682	691	Good price on this heavy passive-color note with sound features.
8.4	4:06	CA/9.4"	800/886-2671	3707	692	Fast and heavy DX4-75 has sound—and an active-matrix color screen.
6.6	4:19	CD/9.5"	800/582-0524	3709	693	Attractive price on well-constructed ZDS model, but the hard drive is very small.
7.2	4:05	MP/9.5"	800/765-1767	3681	694	Last monochrome holdout on chart provides sound, a small hard drive, and a low price.

can order next month's Top 20 charts and capsule reviews in advance (The Top 20 Flash Report, $9.95; available September 27). Touch-tone phone required. [3] Insufficient customer responses to our Reliability and Service Monitor to gauge service performance and reliability. For our overall evaluation, we use an average rating derived from all companies for which we have received fewer than 100 responses.

For more information about all products in this table, circle reader service no. 906.

Top 20 Notebooks

TEXAS INSTRUMENTS' TRAVELMATE 5000, A fast new P-75 system, dislodges the consistently successful Toshiba T4900CT from the number one slot this month. The new $4799 TI provides a big active-matrix color screen plus a large 810MB hard drive. And its battery life is the best we've seen on a Pentium notebook—the dual lithium ion batteries lasted an impressive 5.75 hours in our tests.

In the budget section, Sharp drops the price $200 on its dual-scan color Cx486DX2-66 PC-3010 and achieves a number one rating. The second-place budget Best Buy is the well-balanced MPC TouchNote 700. WinBook, introducing fresh models, is back on the budget chart this month. Its new WinBook XPC, a DX2-50 contender featuring 16MB of RAM, nails down fifth place.

Power Notebooks

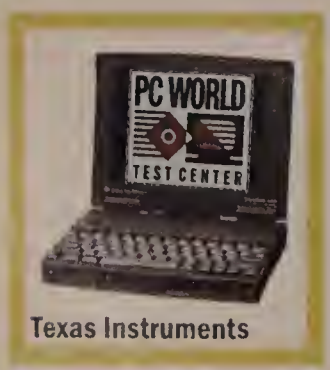
1 Texas Instruments TravelMate 5000

NEW THIS MONTH

PROS: Outstanding battery life, very fast, light, built-in sound, three-year warranty

CONS: Hard-to-master mouse buttons, manual lacks some details

How does a system capture top spot on our power notebooks chart? By doing almost everything well. Texas Instruments' 6.4-pound TravelMate 5000 is a sterling addition to TI's TravelMate family. It excels in four important areas: performance, display, battery life, and portability. Overall, this is one of the speediest P-75 notes we've tested. The PCI graphics controller and 10.3-inch color-active screen provide up to 65,536 simultaneous colors. And the TravelMate's dual lithium ion batteries lasted a long 5.75 hours in our tests. You also get 16-bit audio and a built-in speaker. With these features, its $4799 street price with 8MB of RAM and an 810MB hard drive is very reasonable.



Texas Instruments

Clever design touches abound: Port covers retract at the touch of a button, and the keyboard is crisp and comfortable. The minijoystick pointing device works well once you master the buttons, which are positioned challengingly close to the <Space> bar. Support includes a three-year warranty, along with new round-the-clock technical support. This notebook is exceptionally well balanced, with good performance, an outstanding battery, and fine portability—all at a reasonable price. That's what it takes to become our new champion.

2 Toshiba T4900CT

REVIEWED: March 1995

PROS: Formidable performance, 810MB hard drive, three-year warranty

CONS: One of the pricier notebooks on the market today

A Best Buy since its debut seven months ago, this $5899 Pentium-75 comes with an 810MB hard drive, almost 4 hours of battery life, a lovely active-matrix color screen, and great support.

3 AST Ascentia 910N

REVIEWED: April 1995

PROS: Lithium ion battery runs for almost 8 hours on a charge, three-year warranty

CONS: Some looseness in the screen hinge

4 Compaq LTE Elite 4/75 CXL

REVIEWED: August 1995

PROS: Top service and reliability records, 7.3-hour battery, 10.3-inch active-matrix color screen

CONS: Expensive, a tad poky for a DX4-75

5 Gateway 2000 Liberty DX4-100

REVIEWED: July 1995

PROS: Speedy DX4-100 performance, almost 7 hours of battery life, light 6.6-pound weight

CONS: One-year warranty, dull screen colors

6 Gateway 2000 ColorBook2 DX4-100

REVIEWED: August 1995

PROS: Fastest DX4-100 notebook on our power chart, 6.8-pound weight, 24MB of RAM

CONS: Spartan one-year warranty, passive screen has pale colors

7 Dell Latitude XP 4100CX

REVIEWED: April 1995

PROS: Very long 6.8-hour battery life, three-year warranty

CONS: Readers report long waits on hold when calling sales lines

8 Toshiba Satellite Pro T1250CDT

REVIEWED: July 1995

PROS: Very lively performer, CD-ROM drive, long battery life, integrated audio

CONS: Pricey, heavy, brightness control difficult to locate, awkward battery swapping

9 IBM ThinkPad 755CD

REVIEWED: April 1995

PROS: Strong performance, built-in CD-ROM drive, color-rich screen, lots of extras

CONS: Price among the highest on Notebooks Top 20

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10 NEC Versa P/75HC

REVIEWED: June 1995

PROS: Excellent performance, three-year warranty, high-resolution 800 by 600 color display

CONS: Expensive, no weekend tech support, heavy, limited power-management settings

Budget Notebooks

1 Sharp PC-3010

REVIEWED: September 1995

PROS: Inexpensive, long battery life, excellent screen, infrared (IrDA) communications port

CONS: Limited support policies with a one-year warranty and no weekend tech support

This 7.2-pound Cyrix 486DX2-66 color dual-scan system has a 324MB hard drive, a 5.2-hour battery, and an IrDA port. A price drop of $200 elevates this $1899 PC to Best Buy status.

2 MPC TouchNote 700

REVIEWED: July 1995

PROS: Very affordable, almost 5 hours of battery life, good built-in sound

CONS: Poor support policies

With an 528MB hard drive, a 9.4-inch dual-scan display, and built-in sound, MPC's $2275 DX4-75 unit gives you a lot for the money.

3 Austin Business Audio 4/75

REVIEWED: February 1995

PROS: Attractive $2256 price for respectable DX4-75 performance, 24-hour tech support

CONS: One-year warranty, 8.2-pound traveling weight, limited power management

4 CTX EzBook DX4/75

REVIEWED: September 1995

PROS: Good performance for the price, long battery life, easy-to-use pointing device

CONS: No money-back guarantee

5 WinBook XPC

NEW THIS MONTH

PROS: Good price for 16MB of RAM, 14.4-kbps internal modem

CONS: Short warranty

WinBook's new DX2-50 notebook didn't dominate a category, but it racked up an impressive overall rating. For $2679, you get 16MB of RAM, a 10.3-inch dual-scan color display, a 14.4-kbps voice-enabled fax-modem, stereo sound, and a 351MB hard drive. The weight is reasonable at 7.2 pounds, and its battery lasted almost 5.5 hours in our tests.

WinBook

The price listed includes both a TrackPoint and a GlidePoint miniature touchpad. If you want just the TrackPoint, you'll save about $80. The case is sturdy, with the keyboard set back to make room for the touchpad. For $399 extra you can buy a docking station with a Toshiba CD-ROM drive, a free drive bay, a free ISA slot, and speakers. The warranty lasts just one year, but there's a two-day turnaround policy on factory repairs. Tech support is available 13 hours weekdays, 7 hours Saturdays. This is the usual solid WinBook package—unspectacular, but a fine overall value.

6 Acom Patriot 4000 DX4-100

REVIEWED: May 1995

PROS: Fastest note on the Budget chart, 10.3-inch dual-scan color screen, 14.4-kbps fax-modem

CONS: One-year warranty, subpar 2.8-hour battery life, 8.4-pound traveling weight

7 Acom Patriot 4000 DX2-66

REVIEWED: March 1995

PROS: Low $2030 price for decent performance, 344MB hard drive, 10.3-inch screen

CONS: Heavy 8.4-pound weight, dull screen colors, no established turnaround time for repairs

8 AMS SoundPro DX4-75

REVIEWED: July 1995

PROS: Exceptionally speedy for a budget note, decent 4-hour battery life, great sound

CONS: Heavy at 8.4 pounds, one-year warranty

9 ZDS Z-Star EX

REVIEWED: May 1995

PROS: Light at 6.6 pounds, modular design, 4.3-hour battery life

CONS: One-year warranty , very small 200MB hard drive

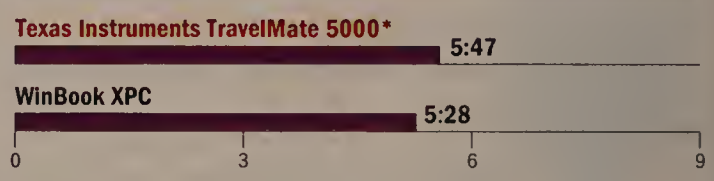
10 ArmNote TS30M

REVIEWED: March 1995

PROS: Low price, good monochrome screen, 7.2-pound traveling weight, 4-hour battery life

CONS: One-year warranty on parts, small 260MB hard drive

TEST REPORT Battery Life



*Best Buy

Time in hours:minutes.

Methodology
We drain and fully recharge the battery twice and set power-saving options to match a consistent profile where possible. Office workers use Windows applications, periodically saving and allowing regular idle time. Notebooks are rotated among workers. We report the time elapsed when the notebook shuts itself off.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

Type this in at 10:30... **...Print this out at 10:33.**

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   (Yes)
   Fill out Purchase Requisition
   Form #P-27.
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   Form #P-95.
Purchase Amount:
   (Under $100 use corporate
   credit card)
   (From $100 to $999 use purchase
   order terms 2-10 Net 30)
   (From $1,500 to $5,000 use
   purchase order terms Net 15)
Submit Requisition.
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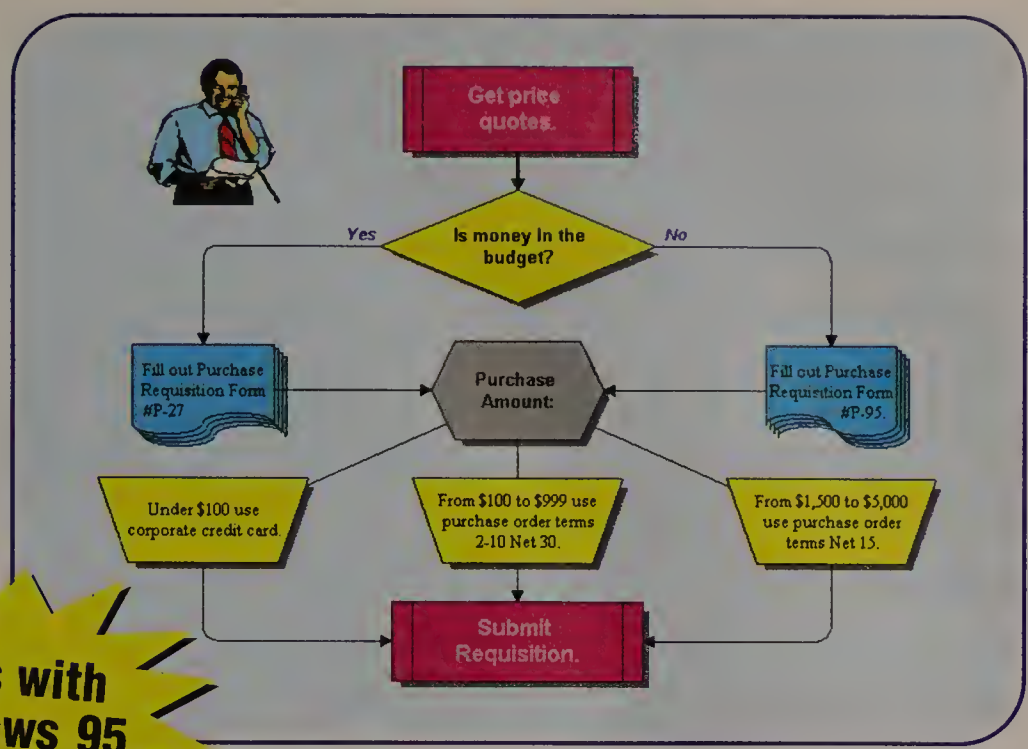

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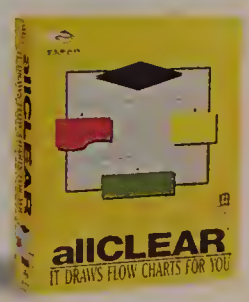

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Slimnote 890CX $3499
(Business Lease $118/Mo.)
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FEATURES COMPARISON This Month's Contenders—Desktops

● = Yes ○ = No

n/a = not applicable

Standard features	Blackship P-75 Neptune	Blackship P-90 Neptune	Micro Express MicroFlex-PCI/P902	Netis N575	PerComp P133 Professional	Quantex QP5/100 SM-1	Zenon Dream Media P5-133
Street price as of 07/10/95 [1]	$1795	$1995	$1949	$2015	$4295	$2899	$3199
CPU	Pentium-75	Pentium-90	Pentium-90	Pentium-75	Pentium-133	Pentium-100	Pentium-133
CPU or upgrade socket	320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin	321-pin ZIF	320-pin ZIF	321-pin ZIF
BIOS	AMI v1.00.01.BS0 2/3/95	AMI 2/3/95 v1.00.01.BS0	Award 4/29/95 v4.50G	Award Modular v4.50G 4/6/95	AMI 10/10/94 P55CW 1.3	Award 3/8/95 v4.50GP	AMI 10/10/94, P55CW 1.3
Installed/maximum RAM (MB)	8/128	8/128	8/128	16/192	16/128	16/128	16/128
SIMM sockets/number free	4/2	4/2	4/2	6/4	4/0	4/2	4/2
Secondary RAM cache installed/maximum (K)	256/256	256/256	256/1024	256/512	256/256	256/512	256/256
Case style	compact	compact	minitower	tower	minitower	tower	tower
Free externally accessible 3½-inch/5¼-inch drive bays	0/1	0/1	1/2	0/3	1/1	0/3	1/2
Free internal 3½-inch/5¼-inch drive bays	1/0	1/0	1/0	2/1	0/0	4/0	2/0
Free 32-bit EISA/16-bit ISA/8-bit ISA expansion slots	0/2/0 [2]	0/2/0 [2]	0/3/0	0/4/0 [2]	0/2/0 [2]	0/2/0 [2]	0/1/0 [2]
PCI or VL bus slots/number free	3 PCI/2 [2]	3 PCI/2 [2]	3 PCI/0	3 PCI/2 [2]	4 PCI/2 [2]	3 PCI/2 [2]	4 PCI/3 [2]
Hard disk	Quantum 540A	WD Caviar 2850	Quantum 540A	Conner FilePro CFA1275A	WD Caviar 31200	WD Caviar 31200	Quantum 1080A
Size (MB)	541	854	541	1278	1200	1200	1080
Adapter	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Floppy drives (MB)	1.44	1.44	1.44	1.44	1.44	1.44	1.44
Graphics adapter	STB Vision	STB Powergraph 64 PCI	STB Velocity 64V PCI	Diamond Stealth 64 DRAM	Diamond Stealth 64 VRAM	ATI Graphics Xpression	Diamond Stealth 64 VRAM
Installed VRAM/DRAM (MB)	0/2	0/2	2/0	0/2	2/0	0/2	2/0
Monitor	ADI MicroScan 4GP	ADI MicroScan 4GP	GVC M1566	Sampo Alpha-Scan 15g	PerComp DA1765VA F	Mag DX17F	Mag DX15E
Tube/viewable area (diagonal inches)	15/13.6	15/13.6	15/14.1	15/14	17/16	17/15.9	15/14.2
Dot pitch (mm)	.28	.28	.28	.28	.26	.26	.28
Modem speed for fax/data (kbps)	14.4/14.4	14.4/14.4	n/a	n/a	n/a	14.4/28.8	14.4/14.4
Sound board	Creative Labs SB 16 Value	Creative Labs SB 16 Value	n/a	n/a	Ensoniq Soundscape	16 Pro Mad Sound Card	Creative Labs SB AWE32
CD-ROM drive	Teac CD-55A	Teac CD-55A	Toshiba XM-5302B	n/a	Plextor 6Plex PX-63CS	Toshiba XM-5302B	Pioneer DR-UA124X
Data transfer rate (K/sec)	600	600	600	n/a	900	600	600
Parallel/serial/mouse/SCSI ports	1/2/0/0	1/2/0/0	1/2/0/0	1/2/0/0	1/2/0/1	1/2/0/0	1/2/0/0
Service and support							
Warranty (years)	3 [3]	3 [3]	2	3 [3]	3	1	1
30-day money-back guarantee	●	●	●	●	●	●	●
On-site service first-year price	free	free	free	$70	free	free	$50
Repair turnaround policy (days)	2	2	2	2	1	1	3
Daily toll-free phone support (hours)	10.5	10.5	24 [4]	10	24	11 [5]	12
Weekend support	○	○	●	● [6]	●	● [6]	●
BBS/fax	●/●	●/●	○/●	●/●	●/●	●/●	●/●

[1] All systems priced as configured with DOS 6.0 or later version, Windows 3.1, VGA and color monitor, keyboard, and mouse or other pointing device. Price is direct or based on vendor estimate.

[2] One less ISA slot available when all PCI slots are filled, and vice versa.

[3] One year parts, three years labor.

[4] Toll-free weekdays only.

[5] Nine hours on Fridays.

[6] Saturday only.

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Circle 70 on reader service card

System Snapshots

These desktops and notebooks were tested and reviewed along with the others but didn't score high enough to reach the Top 20 charts.

Alaris P590

PROS: Excellent P-90 performance, multimedia configuration, three-year warranty

CONS: Ten-day turnaround policy on service-center repairs

This fast system almost makes the Top 20 with a 540MB hard drive, 256K of secondary cache, and a robust 16MB of RAM at a very reasonable $2199 price. The competition is so tough, however, that the long service turnaround policy keeps it off the chart. *Alaris, 800/317-2348, 510/770-5700* **Reader service no. 615**

Austin Vista Notebook

PROS: 24-hour tech support, 11.3-inch dual-scan color display

CONS: Slow for a DX4-100, short one-year warranty

Unit configured with 8MB of RAM and a good-size 810MB hard drive tested out slow. Its 4-hour battery life and 7.8-pound weight are okay but not good enough to lift this notebook onto the chart. $3174. *IPC Technologies, 800/331-1501, 512/339-3500* **Reader service no. 631**

Boxlight Multibook C200 Presentation Notebook

PROS: Excellent 5.75-hour battery life

CONS: Slow for a DX4-75, pricey, one-year warranty

Heavy 8.8-pound notebook has 16-bit sound, 16MB of RAM, a 510MB hard drive, and a small 8.5-inch active-matrix color screen. $6999. *Boxlight, 800/762-5757, 360/779-7901* **Reader service no. 632**

Canon Innova Book 200LS

PROS: Spacious 11.3-inch dual-scan color screen, 24-hour replacement of defective systems

CONS: Slow for a DX4-100 notebook, short one-year warranty

This 7.8-pound notebook comes with 8MB of RAM and a 524MB hard drive. The battery life is reasonably good at over 4.5 hours, but service and performance shortfalls keep it off the list. $3199. *Canon Computer Systems., 800/848-4123, 714/438-3000* **Reader service no. 633**

Canon Innova MT9010

PROS: Multimedia configuration, 14.4-kbps fax-modem, three-year warranty

CONS: Slow performance for a Pentium-90

P-90 minitower has 8MB RAM, a 1083MB hard drive, a 4X CD-ROM drive, a 1MB VLB graphics adapter, and a 15-inch monitor. It's very slow: Many P-75s are faster. $2798. *Canon Computer Systems, 800/848-4123, 714/438-3000* **Reader service no. 616**

CompuAdd C133MHz

PROS: Top-notch performance, multimedia configuration

CONS: No free SIMM sockets, one-year warranty, high price

Very fast Pentium-133 minitower with 16MB of RAM and a big 1624MB hard drive barely missed our chart. CompuAdd's round-the-clock tech support helps mitigate the short warranty, but this is a high price to pay for a 15-inch monitor. $4269. *CompuAdd Computer, 800/627-1961, 512/250-1489* **Reader service no. 617**

Gateway 2000 P5-75 Family PC

PROS: Well-priced home PC with three-disc CD-ROM changer

CONS: Slow performance for a Pentium-75 system

Solid family system includes a 730MB hard drive, a 14.4-kbps fax-modem, and Microsoft's Bob, Bookshelf, Cinemania 95, Encarta, Family Pharmacist, Money, Works, and more. But its 8MB of fast EDO RAM doesn't compensate for the lack of a secondary cache. $2199. Gateway 2000, 800/846-2000, 605/232-2000 **Reader service no. 618**

Micro Express MicroFlex-PCI/DX4/Home

PROS: Inexpensive; multimedia configuration

CONS: Very poor performance

AmDX4-100 PCI system with 8MB RAM, 1MB caching drive controller, small 540MB hard drive, and good 15-inch GVC monitor has nice price but performs more like a DX2-66. $1795. *Micro Express, 800/989-9900, 714/852-1400* **Reader service no. 619**

MidWest Micro P5-100 Office PC

PROS: Terrific Pentium-100 performance; bundled Microsoft Office, Encarta, and Bookshelf; three-year warranty

CONS: No sound features to go with the 4X CD-ROM drive

P-100 unit turns in superb performance with 16MB of RAM, 256K of secondary cache, and a 1080MB hard drive. The price is fairly reasonable, but the lack of multimedia features keep this unit off our power chart. $2999. *MidWest Micro, 800/728-8582, 513/368-2609* **Reader service no. 620**

MIS/P120

PROS: Sizeable 1200MB hard drive, 17-inch monitor, full multimedia configuration

CONS: Relatively slow P-120 performance, one-year warranty

Compact with 16MB of RAM, a 1200MB hard drive, and bundled Microsoft Encarta, Entertainment Pack, and Works. The 45-day money-back guarantee is nice, but this PC needs better performance to rate a Top 20 berth. $3884. *MIS Computers, 800/733-9188, 510/226-9188* **Reader service no. 621**

Netis N5100

PROS: Fast Pentium-100 performance, 4X CD-ROM drive

CONS: Minimal one-year warranty, no sound card or speakers

Midsize tower has the Intel Triton chip set, a 256K secondary cache, 16MB of RAM, and a 1278MB hard drive. And it's one of the least expensive P-100's we've seen. If it had multimedia features and a longer warranty, it would make our Power Desktops Top 20. $2550. Netis Technology, 800/577-7526, 408/263-0368 **Reader service no. 622**

NMC Expert-System+ P100

PROS: Affordable price, multimedia configuration

CONS: Low-end 15-inch monitor, fairly slow for a Pentium-100

Pentium-100 with 8MB of RAM and an 850MB hard disk is amazingly cheap. The monitor needed manual configuration, however, and system performance is more typical of a quick Pentium-90. $2375. *National MicroComputers, 800/800-4662, 801/265-3700* **Reader service no. 623**

Packard Bell Pentium 100 Multimedia PC

PROS: Multimedia configuration, inexpensive

CONS: Very slow for a Pentium-100; lacks expandability; poor service and reliability ratings

Compact with 8MB RAM and a 1083MB hard drive comes with two CD-ROM drives, but they're outdated double-speed units. Microsoft Works and a nice bundle of

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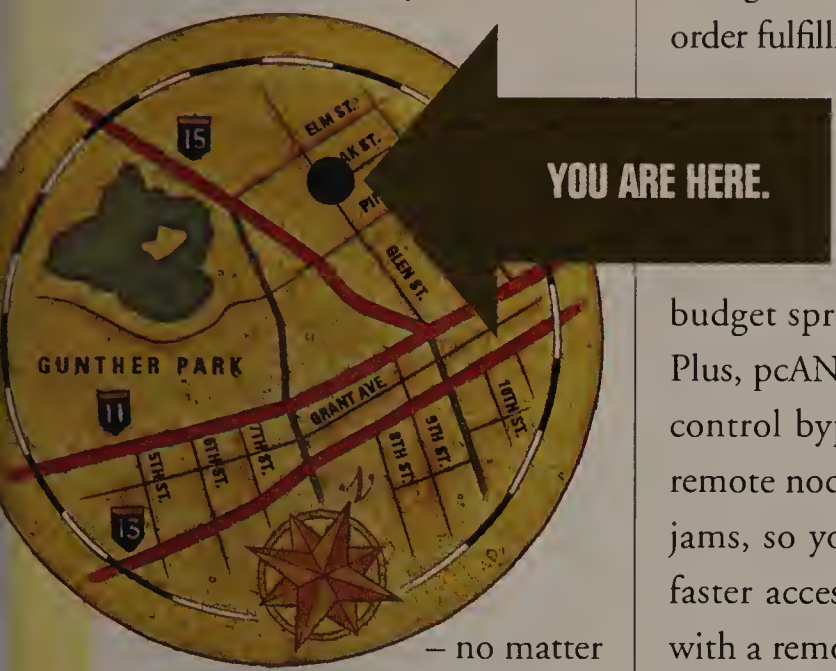

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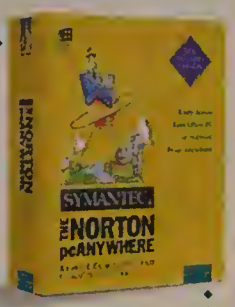

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multimedia apps are included. But many P-90s are faster than this P-100, and it has no free drive bays. Packard Bell rates poorly in reliability and service on our surveys. $2499. *Packard Bell Electronics, 800/733-7526, 408/263-0368* **Reader service no. 624**

PerComp P120 Professional

PROS: Excellent P-120 performance, premium multimedia components, 24-hour tech support, three-year warranty

CONS: High price, no free SIMM sockets

Fast minitower P-120 almost makes Power chart with 16MB of RAM, 1200MB hard drive, 17-inch monitor, SCSI port, 6X CD-ROM drive, and high-quality speakers. But its even-faster 133-MHz Top 20 sibling costs just $100 more and is a better value. $4195. *PerComp Microsystems, 800/856-6688, 214/234-2198* **Reader service no. 625**

Polywell Poly 500T8

PROS: Multimedia configuration, reasonable price

CONS: No free SIMM sockets, sluggish P-100 performance

P-100 tower with high-quality 4X Toshiba CD-ROM drive has performance that's torpid for a Polywell, and its interior is cluttered with cables. New six-day-a-week 24-hour tech support helps—but not enough. $2799. *Polywell Computers, 800/999-1278, 415/583-7222* **Reader service no. 626**

Quantex QP5/120 WS-1

PROS: 17-inch monitor, 28.8 /14.4-kbps fax-modem

CONS: One-year warranty, pedestrian performance, no sound

Pentium-120 system offers a pretty fair value with 16MB of RAM, a 1200MB hard drive, and a 4X Toshiba CD-ROM drive. But there is no sound, and this unit barely outperforms its P-100 sibling. $3099. *Quantex Microsystems, 800/896-4898, 908/563-4166* **Reader service no. 627**

Robotech Cobra XL DX4-100

PROS: Reasonable price, multimedia configuration

CONS: A bit of cable clutter inside compact case

Aside from its multimedia components, this solid-performing DX4-100 system has just the basic equipment: 8MB of RAM, a fairly small 540MB hard drive, and a 15-inch monitor. Even so, it almost makes our Budget chart. $1949. *Robotech, 800/533-0633, 801/565-0645* **Reader service no. 628**

Samsung SensLite 200

PROS: Good price, integrated sound

CONS: Very small screen with 7.9-inch diagonal, one-year warranty, no weekend tech support

Small 6-pound DX4-75 subnote has 8MB of RAM and a 540MB hard drive, and the price is good for a color-active model. But support shortcomings keep it off the chart. *Samsung Electronics America, 800/316-9914* **Reader service no. 634**

PENTOMS COMPARISON This Month's Contenders—Notebooks

● = Yes ○ = No

n/a = not applicable

Standard features	Texas Instruments TravelMate 5000	WinBook XPC
Street price as of 7/10/95 [1]	$4799	$2679
CPU	Pentium-75	486DX2-50
Traveling weight (pounds) [2]	6.4	7.2
Width x depth x height (inches)	10.9 x 8.5 x 2.3	11.5 x 8.9 x 2
Installed/maximum RAM (MB)	8/32	16/32
Secondary RAM cache installed/maximum (K)	256/256	0/0
Installed/maximum hard disk (MB)	810/810	351/520
Removable hard disk	●	●
Display type	color active	color dual-scan
Measured screen diagonal (inches)	10.3	10.3
Maximum colors or gray shades of LCD	256	256
Simultaneous LCD and external monitor	●	●
Highest resolution of external monitor	1280 x 1024	1024 x 768
Mouse/keyboard ports	●/○ [3]	●/○ [3]
Cursor keys in inverted T	●	●
Dedicated page-control keys	●	○
All 12 function keys dedicated	●	○
Standard <Ctrl> and <Alt> layout	○	○
Built-in pointing device	●	●
Modem speed for fax/data (kilobits per second)	n/a	14.4
Docking station available	●	●
PC Card (PCMCIA) slot Type II/III	2/1 [4]	2/1 [4]
Power management		
Supports Advanced Power Management	●	●
Type of battery	lithium ion	NiMH
Suspend button	●	●
Suspends when case closed	●	○
Service and support		
Warranty (years)	3	1
30-day money-back guarantee	●	●
On-site/replacement service first-year price	$189	○
Repair turnaround policy (days)	2	2
Daily toll-free phone support (hours)	24	13
Weekend support	●	● [5]
BBS/fax	●/●	●/○

BEST BUY

[1] All notebooks priced as configured with DOS 6.0 or later version, Windows 3.1, VGA monochrome or better display, and mouse or other pointing device. Price is direct or based on vendor estimate.

[2] Includes computer, adapter, power cord, and external floppy drive if notebook has one.

[3] Mouse port doubles as a keyboard port.

[4] Type III slot alternatively accepts two Type II devices.

[5] Saturdays only.

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USA Flex Custom PT-90 Multimedia

PROS: Good Pentium-90 performance, multimedia configuration, 14.4-kbps fax-modem, three year warranty

CONS: Some cable clutter inside the minitower case

This fine Pentium-90 system presents as good a value as you will find in this section. It comes with 8MB of RAM, an 850MB hard disk, American Heritage Talking Dictionary, Compton's Interactive Encyclopedia, Microsoft Money and Microsoft Works, IDG Books' *The Internet for Dummies*, and many additional applications and books. If the price were just a few dollars lower, this unit would have won a place on the Budget Top 20. $2239. *USA Flex, 800/872-3539, 708/351-6202* **Reader service no. 629**

USA Flex PT-133

PROS: High-quality Turtle Beach sound card, fast CD-ROM drive, voice-enabled fax-modem

CONS: High price even for a superbly configured Pentium-133

USA Flex has been sending us some very good systems lately that have just missed our charts. This classy minitower model has a wonderful collection of top-of-the-line components, including 16MB of EDO RAM, 256K of pipeline-burst secondary cache, a 1200MB hard drive, a high-quality Plextor SCSI 6X CD-ROM drive, and a 17-inch Nokia monitor. However for a Pentium-133, it is a bit on the slow side. $4599. *USA Flex, 800/872-3539, 708/351-6202* **Reader service no. 630**

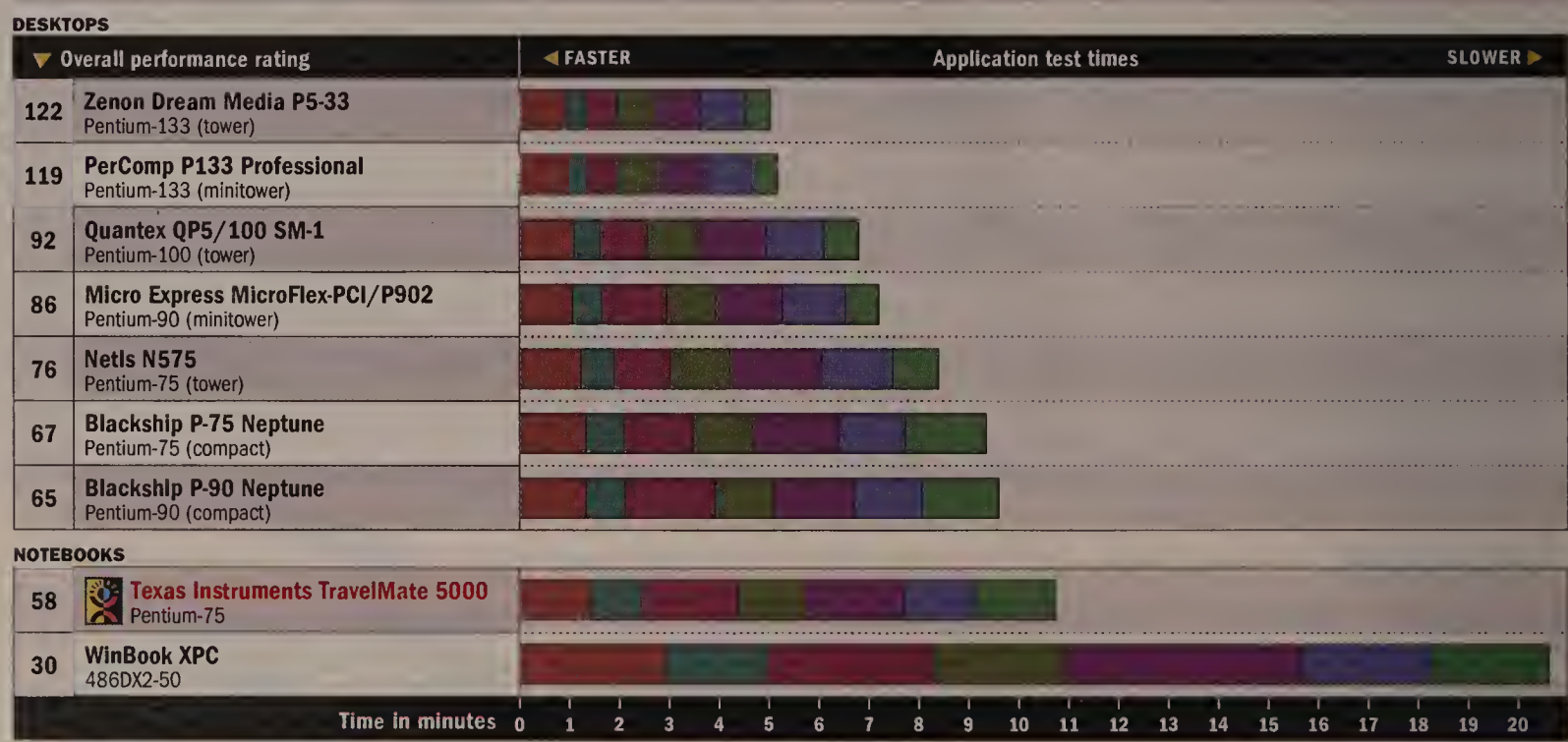
Zeos Meridian 850A

PROS: Impressively fast performance for a notebook, 24-hour toll-free technical support

CONS: So-so battery life, short one-year warranty, fairly heavy 8.2-pound traveling weight

Pentium-75 notebook is configured for very demanding use with an amazingly robust 32MB of RAM, an unusual (for a notebook) 256K of secondary cache, a big 810MB hard drive, and a 9.5-inch color-active screen. It's as fast as some quick Pentium-75 desktops, but the battery life of about 3.25 hours barely gets you by. Still, high performance and a reasonable price make it a solid value. $4995. *Zeos, 800/554-5220, 612/362-1234* **Reader service no. 635**

TEST REPORT This Month's Contenders



BEST BUY

Systems are arranged in order of overall performance from best to worst, based on the normalized, weighted scores from seven tests. A system may have a better overall performance rating than another system that took less time to complete our test suite.

Methodology

We tested each system as supplied by the manufacturer, using the version of DOS supplied. If we installed Windows, we used the default installation. We configured Windows with an HP LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. We set video resolution to 800 by 600 pixels in 256 colors using the supplied video driver where possible. We loaded the test applications and files and test automation software and scripts.

Word 2.0 for Windows
We worked with 1-, 9-, and 28-page business documents. Operations included creating, saving, opening, scrolling, editing, checking spelling, formatting, previewing, and printing.

Excel 4.0
We opened a file and performed several data extracts, entered new data, altered calculations, formatted, scrolled, moved blocks, previewed, printed, and saved.

Paradox 1.0 for Windows
We used a custom form to add a moderate number of records to an existing table, performed several queries, and generated a report.

Freelance 1.0 for Windows
We built a six-page presentation using a standard template, clip art, text, and charts; applied several views to the presentation; then previewed and saved it.

WordPerfect 6.0 for DOS
We performed a variety of editing, formatting, previewing, and printing tasks on documents ranging from a single-page memo to a long report. Due to memory requirements, the amount of free memory for DOS in the first 640K dramatically affects this test.

1-2-3 release 3.4 for DOS
Using the graphical Wysiwyg add-in and working in three different files, we created and altered formulas, built graphs, saved, and printed.

Paradox 3.5 for DOS
We tested Paradox 3.5 running under Windows in a DOS window. We entered data, searched records, updated, and generated reports from a simple customer list.

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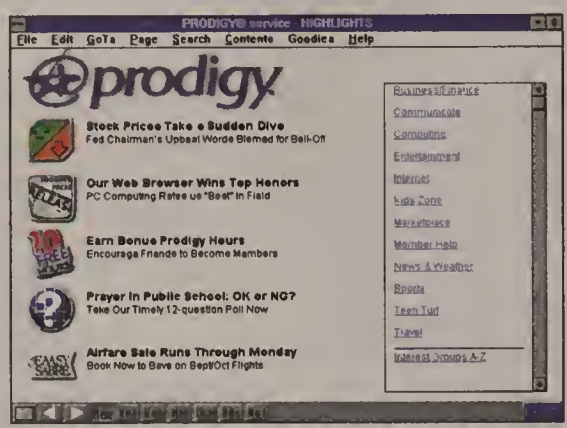

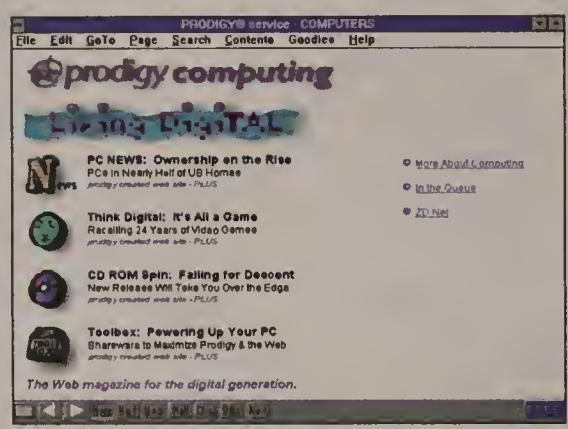

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Win a Polywell Poly 486-80VB

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Polywell Poly 486-80VB, an Am486DX2-80 PC in this month's Top 20.

HOW TO ENTER: FOR BEST RESULTS, PHOTOCOPY THIS PAGE, DO NOT TEAR IT OUT. Fax your completed questionnaire to *PC World* at 415/974-7367. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 10-SS, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by October 31.
PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact prize winners at the telephone and fax numbers they provide. If *PC World* is unable to do so within 30 days of the drawing, a substitute winner will be selected. No purchase necessary. Void where prohibited by law.
HOW TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER ___ – ___ – ____

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

How did you get this copy of *PC World*?
○ By subscription ○ On the newsstand ○ From someone else

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

○ Acer ○ Acma ○ ALR ○ Apple ○ AST ○ AT&T (NCR) ○ Austin (IPC) ○ Axik ○ Blackship ○ Canon ○ Compaq ○ CompuAdd
○ Compudyne ○ Comtrade ○ Cornell ○ CTX ○ Dell ○ Diamond ○ Digital (DEC) ○ DTK ○ Eltech ○ EPS ○ Epson ○ Everex
○ Future Tech ○ Gateway 2000 ○ Hewlett-Packard ○ HiQ ○ Hyundai ○ IBM ○ Insight ○ Intelesys ○ Leading Edge ○ Micro Express ○ Micron ○ Midwest Micro
○ MIS ○ NEC ○ Netis ○ Packard Bell ○ Panasonic ○ PerComp ○ Pionex ○ Polywell ○ Quantex ○ Samsung ○ Sharp ○ Swan
○ Tandy ○ Tangent ○ Texas Instruments ○ Toshiba ○ Twinhead ○ USA Flex ○ VTech (Expotech, Laser) ○ WinBook ○ Zenith (ZDS) ○ Zenon ○ Zeos ○ Other

What size is this PC?
○ Desktop ○ Notebook/laptop ○ Handheld

What is the CPU?
○ PowerPC ○ Pentium ○ 80486 ○ 80386 ○ Other

Where did you buy this PC?
○ Local dealer ○ Mail/phone order ○ Direct from field sales force ○ Membership discount store ○ Computer superstore ○ Home electronics store ○ Retail store ○ Value-added reseller ○ Other

After ordering, how long did it take to get your PC?
○ Less than 1 week ○ 1–2 weeks ○ 3–4 weeks ○ More than 4 weeks

Who set up your PC?
○ Dealer/retailer/VAR ○ Staff computer technician ○ Self or coworker

WHEN YOU FIRST GOT YOUR PC

When did you buy this PC? (Specify month and year.)

○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec
○ 90 ○ 91 ○ 92 ○ 93 ○ 94 ○ 95

When you first set up your PC, were any components "dead on arrival" (DOA)?
○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)
○ Battery ○ CD-ROM ○ CPU ○ Floppy drive ○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory ○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse ○ Power supply ○ Sound board ○ Other

Did your problem occur only after you added your own hardware or software?
○ Yes ○ No ○ Don't know

Would you buy this brand of PC again?
○ Yes ○ No ○ Not sure

How many times have you had a problem with this PC?
○ No problem ever ○ One ○ Two ○ Three ○ Four ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Please answer for the most recent problem—*other than DOA*—not reported in a previous survey.

When did this problem occur? (Specify month and year.)

○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec
○ 90 ○ 91 ○ 92 ○ 93 ○ 94 ○ 95

How long was this after you purchased your PC?
○ Less than 1 month ○ 1–3 months ○ 4–6 months ○ 7–12 months ○ More than 12 months ○ Not sure

Did the problem occur as a result of adding new hardware or software?
○ Yes ○ No ○ Don't know

Did the problem occur under warranty?
○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)
○ Faulty component ○ Incorrectly installed software ○ Wrong configuration ○ Faulty peripheral ○ Device conflicts ○ OS problem ○ Other ○ Don't know

If a component failed, which one was it? (Mark all that apply.)
○ Battery ○ CD-ROM ○ CPU ○ Floppy drive ○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory ○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse ○ Power supply ○ Sound board ○ Other

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your PC?
○ Manufacturer ○ Dealer/store where purchased ○ Manufacturer's authorized repair technician ○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)
○ Phone ○ On site ○ In store ○ System swap ○ Component swap ○ Factory return

If you received phone service, how long were you on hold?
○ Not at all ○ Less than 1 minute ○ 1–2 minutes ○ 3–5 minutes ○ 6–10 minutes ○ 11–20 minutes ○ More than 20 minutes

How long did it take before you talked to the person who finally helped you?
○ Less than 15 minutes ○ 15 minutes–1 hour ○ 2–5 hours ○ 6–10 hours ○ 11–24 hours ○ 1½–2 days ○ 3–5 days ○ 1 week or more

How long did it take to resolve the problem completely?
○ 1–2 days ○ 3–7 days ○ 8–14 days ○ 15–30 days ○ More than 1 month ○ Never resolved ○ Awaiting resolution

Was the problem resolved to your satisfaction?
○ Yes ○ No

How would you rate the person(s) who helped you?

	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of PC again?
○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?
○ Not at all ○ ○ Satisfied ○ ○ Extremely satisfied

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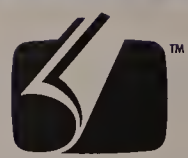

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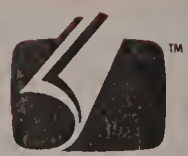

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Ink Jets Deliver Color for the Price of Crayons

Good Software, Too
The sleek NEC SuperScript 610plus runs a pop-up Windows app that reports printer status and defines installed options. It can do spot color, unusual among monochrome lasers.

Whether you're looking for a good color ink jet or a fast laser printer for personal use, the Top 10 Personal Printers chart can guide you to the best values in this crowded market. We tested seven more printers this month, but the Best Buys held steady from our debut in the August issue. The good news for your wallet: Based on local shopping trips, the average street price of the color Best Buy, the Canon BJC-600e, dropped $25 to $467. Among the runners-up, the Epson Stylus Color is now priced around $510—down $16. We also saw the Canon BJC-70 for $335, down $47 from before.

Three color ink jets from Lexmark, Hewlett-Packard, and Olivetti vied for Top 10 placement this month. We also tested two monochrome lasers from Hewlett-Packard and Texas Instruments and two portables from Mannesmann Tally—a monochrome ink jet and a thermal transfer unit. But only one made it into the Top 10 Personal Printer chart: The Lexmark WinWriter 150c, which replaces the company's ExecJet IIc and takes over its number five spot among color printers. At $349, the WinWriter costs $50 more than the ExecJet, but it produces better color output and far better gray-scale images.

Housed in a stylish case, the WinWriter printed near–laser quality text and gray-scale samples. The easy-to-use driver gives you a wealth of options for tweaking output quality. The WinWriter also supports background printing, so you can return to your application faster. (An ink jet printer depends on your PC to process each page; you usually have to put a hold on your work until it has finished with the print job.) Unfortunately, with background printing turned on, the WinWriter takes much longer to print; in fact, it was the slowest ink jet printer we tested.

Hewlett-Packard's new DeskJet 660C followed the Lexmark by a nose. The DeskJet is also very slow,

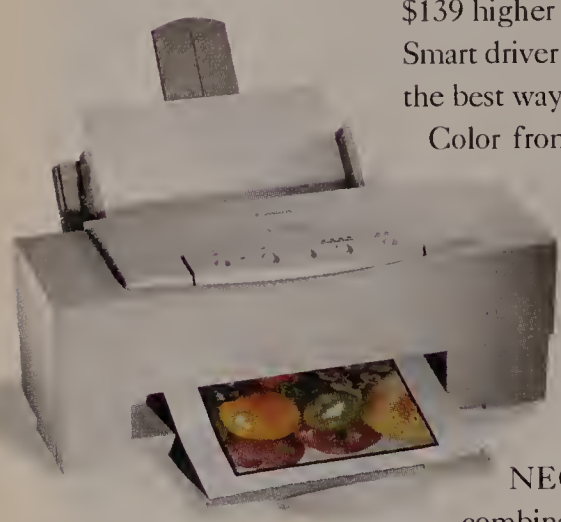
TOP 10 PERSONAL PRINTERS

		Previous rank	First reviewed	Type	Street price	Overall rating	Output rating: Text and gray scale	Output rating: Color	Speed rating: Text and gray scale	Speed rating: Color	Ease-of-use rating	Reader service no.	Comments
BLACK-AND-WHITE	1 NEC SuperScript 610plus 800/632-4636	1	Aug 95	laser	$399	85	67	n/a	55	n/a	72	749	Fast, great 300-dpi output, helpful interface.
	2 Brother HL-630 800/276-7746	2	Aug 95	laser	$389	80	50	n/a	53	n/a	75	750	Least expensive laser, 300 dpi, flat paper path.
	3 NEC SuperScript 660 800/632-4636	3	Aug 95	laser	$599	78	64	n/a	51	n/a	72	751	Fast 600-dpi laser with great output.
	4 Brother HL-660 800/276-7746	4	Aug 95	laser	$700	78	57	n/a	43	n/a	81	752	Pricey, slower, loud fan, good 600-dpi output.
	5 Epson ActionLaser 1500 800/289-3776	5	Aug 95	laser	$486	77	64	n/a	42	n/a	81	–	High cost per page but good 300-dpi output.
COLOR	1 Canon BJC-600e 800/848-4123	1	Aug 95	ink jet	$467	85	60	60	27	33	77	754	Great color output and fast, too. Easy to use.
	2 Epson Stylus Color 800/289-3776	2	Aug 95	ink jet	$510	83	57	50	23	28	75	–	Solid 720-dpi output in loud, clunky box.
	3 Canon BJC-70 800/848-4123	3	Aug 95	ink jet	$335	77	50	50	35	26	81	756	Fast and clean output at 720 or 360 dpi.
	4 Digital DECcolorwriter 520ic 800/777-4343	4	Aug 95	ink jet	$349	72	40	40	33	26	59	757	Good 300-dpi printer's color costs are high.
	5 Lexmark WinWriter 150c 800/358-5835	–	current	ink jet	$349	71	51	50	18	13	68	758	Great output comes slowly. Very easy to use.

BEST BUY

Methodology Printers are arranged in order of overall rating. Output quality and features (including hands-on testing) each count for 25 percent of the overall rating. Price, performance, and support policies contribute 15 percent each, and cost of consumables, the final 5 percent. Color printers may receive bonus points for exceptionally good color output.

For more information about all products in this table, circle reader service no. 907.



Best Buy for Color
The Canon BJC-600e, our top color printer, comes with great documentation and software, such as Canon's Color Advisor and a stationery designer, to help you print better.

but it prints better in color (tying with the Epson Stylus Color for the second-best color output score) and is easier to use. But its average street price of $488 is $139 higher than the Lexmark's. HP's handy ColorSmart driver analyzes your color page and determines the best way to print it.

Color from the Olivetti JP 360 ink jet was only passable, and the unit comes with the same complex paper adjustment levers as the Digital DECcolorwriter 120ic, a printer we reviewed in August that also did not make the Top 10.

NEC and Brother lasers still reign over the monochrome printer list. The NEC SuperScript 610plus offers a winning combination of speed, fine print quality, and low price. The Brother HL-630 keeps second place with solid performance and an average street price that is $10 less than the NEC's. The HL-630 also boasts a flatter paper path than most printers, which makes it less likely to jam when you're using thicker paper, envelopes, or transparencies.

The Hewlett-Packard LaserJet 5P just missed a spot on our monochrome list. Despite their premium pricing—this one costs about $829—HP printers dominate the market because of their reputation for quality. The 5P turned in good speed numbers, and it impressed us with sharp gray-scale images, line art, and text. It also received the highest ease-of-use rating of any printer on our list. Its thoughtful design includes cables that are recessed and hidden by small, removable covers, so there are no dangling cords. The price-conscious can find models on our Top 10 list that cost less for equal capabilities, however.

The Texas Instruments microLaser 600 prints about 5 pages per minute at 600 dpi. Print quality is decent. Unlike most personal printers, the microLaser 600 comes with Mac and PC connections and PostScript Level 2. Its cost per page is about a penny, but the unit is expensive (around $899) and somewhat slow compared with other lasers we've tested.

Mannesmann Tally Portables Take On the Canon BJC-70

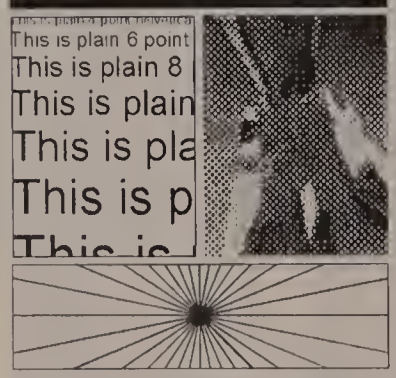
The small, inexpensive (about $299) MobileJet monochrome ink jet we saw from Mannesmann Tally produces only average gray-scale images and below-average text. Folded, the 4.8-pound MobileJet is about half the size of a notebook PC, and its built-in sheet feeder is convenient—just flip open the top lid. The company's thermal transfer MobileWriterPS produced much better text than the MobileJet, but its gray-scale images were only fair. To its credit, the MobileWriterPS is the only portable we've seen that comes with PostScript support. It also prints well on coated ink jet paper—a real advantage considering the scarcity of thermal paper (not to mention its strange texture). But at 8.3 pounds with batteries, it's heavy, and so is its $850 price. Neither unit compares to the Canon BJC-70, which is still number three on the color chart, is much easier to use as a portable, and offers very good output in both monochrome and color.

—Bill Underwood

Bill Underwood is an independent computer consultant and writer with more than 16 years' experience in computer graphics as well as printer design, testing, and manufacturing. Testing was performed by Ulrike Diehlmann of the PC World Test Center.

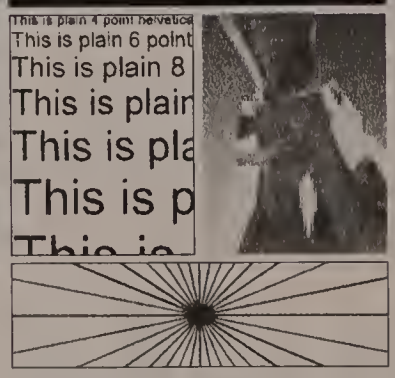
DIGITAL SAMPLES NEC Lets You Read the Small Print; Canon's Color Overshadows Lexmark's

NEC SuperScript 610plus



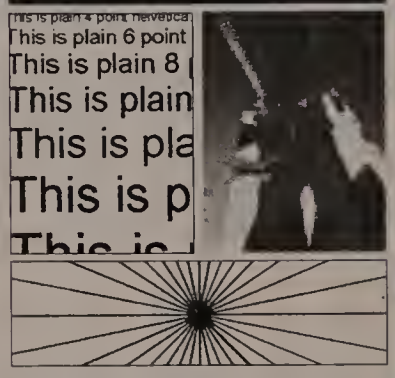
The 300-dpi engine handles gray scale and 4-point text capably. Line thickness varies on the radial starburst.

Canon BJC-600e



Gray scale is smoother than the NEC's when printing at 360 by 360 dpi. The angled lines in the starburst are a little jagged.

Lexmark WinWriter 150c



Text ouput shows some stray dots, but the starburst lines are cleaner. The gray-scale output uses color ink as well as black.

Color Tests

The Lexmark's color palette is a little muted compared to the Canon's, and subtle shadows fade to black, but the colors mix smoothly.

Methodology Output is produced on plain paper at default settings. The samples are judged together in a room with a mix of overhead fluorescent and natural lighting. Text and gray-scale output quality count for 35 percent of the output rating each. Line art quality counts for the remaining 30 percent. Color output counts for an additional 100 percent score that is combined with the monochrome ratings to arrive at a total overall score.

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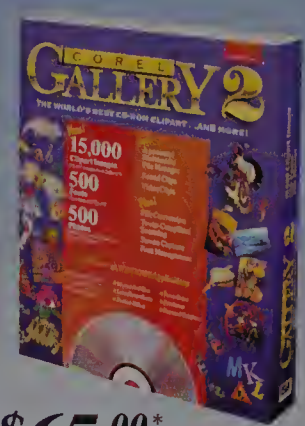

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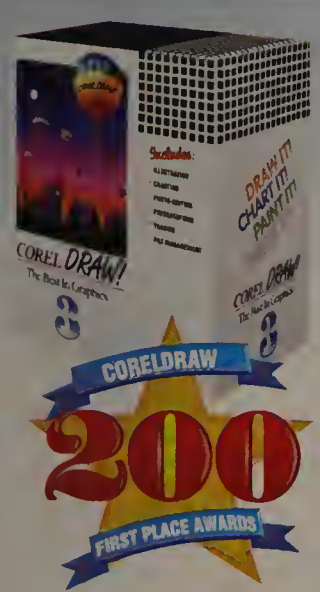

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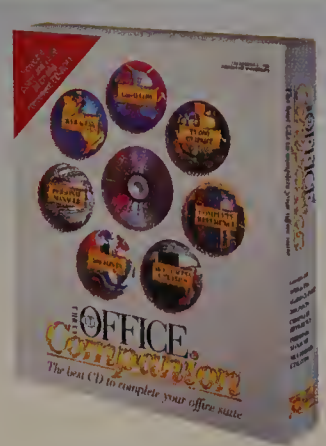

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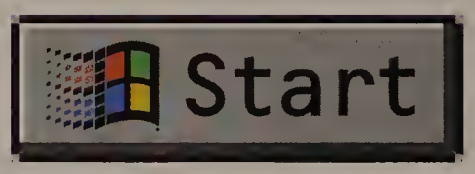

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Scores based on tests run on Gateway 2000 P5-90, 90 MHz Pentium processor, 256KB cache, 16MB RAM, 1024 x 768 resolution, Windows for Workgroups, MS-DOS 6.22.

Now Showing: The PC World Top 10 Monitors

True-to-Life Color
Best Buy Princeton Graphic Systems Ultra 15 can't be beat for great graphics and intuitive on-screen controls. Cost: only $350.

For our first Top 10 list of the best monitors on the market, we've tested a batch of 15-inch units that should please the pocketbook as much as the eye. You'd never guess it from all the media attention lavished on 17-inch monitors, but price and screen area have made 15-inchers almost as popular. Nearly half of *PC World* readers who were recently surveyed by phone said they planned to buy 15-inch monitors, compared to 65 percent who plan on buying 17-inchers.

Fifteen-inch monitors have become attractive to many users because they're bigger than cramped 14-inch units—but much less expensive than 17-inch monitors, which start at around $600. As a bonus, 15-inch units are more likely than 14-inch monitors to include many of the sophisticated features found only on the bigger units just a few years ago—such as digital controls (which remember screen settings) rather than the old analog knobs and thumbwheels.

Large monitors are still best for applications that benefit from higher resolutions, such as CAD. But if you don't need more than 800 by 600 dots per inch (dpi)—1024 by 768 is difficult to read on anything smaller than a 17-inch screen—a 15-inch monitor may be ideal. Whatever size you buy, you'll probably want to make a decision soon: Prices are expected to rise 6 to 10 percent because of a glass shortage and the decline of the dollar.

Good Looks

We put 18 popular 15-inch units through a battery of display and design tests. To arrive at our overall ratings, we also factored in vendors' support policies and tested how easy it was to set up each monitor and adjust its display for the sharpest possible picture.

The best of the bunch was Princeton Graphic Systems' Ultra 15, for two reasons: A bargain $350 price

TOP 10
15-INCH MONITORS

	Overall rating	Text quality rating	Graphics quality rating	Features, design, ease-of-use rating	Street price	Dot pitch (mm)	Max. refresh rate at 800 X 600 (Hz)	Max. refresh rate at 1024 X 768 (Hz)	Reader service no.	Comments
1 Princeton Graphic Systems Ultra 15 800/751-8405	85	60	85	65	$350	0.28	90	76	731	Average text display, but best graphics quality and bargain price. Easy-to-use controls.
2 NEC MultiSync XV15 800/632-4636	82	76	79	70	$460	0.28	75	76	732	Excellent text and graphics quality; Level 1 Plug and Play[1]; low refresh rates, but no visible flicker.
3 ViewSonic 15G 800/888-8583	80	79	68	63	$425	0.28	90	80	733	Large, 14-inch viewable area. Spreadsheets looked the best.
4 Panasonic PanaSync C-1591E 800/742-8086	80	74	68	65	$419	0.27	107	85	734	Crisp text and good graphics due to 0.27mm-dot pitch, high refresh rates, on-screen controls.
5 Sony Multiscan 15sf 800/352-7669	79	85	74	63	$499	0.25	90	78	735	Top-rated text quality and good graphics quality, but it will cost you. Extra-fine aperture grille.
6 ViewSonic 15GA 800/888-8583	79	72	62	85	$525	0.27	108	85	736	Pricey; built-in speakers and microphone; Level 2b Plug and Play[1]; sharp text; 14-inch viewing area.
7 Samtron SC-528 UXL 310/537-7000, ext. 209	78	67	68	53	$360	0.28	75	75	737	Inexpensive; does a good job with text and graphics. Low refresh rates, but flicker-free.
8 Samsung SyncMaster 15GLi 800/993-4110	78	65	66	70	$425	0.28	100	80	738	Level 2b Plug and Play[1], good text and graphics, high refresh rates. Small 13.4-inch viewing area.
9 ADI MicroScan 4V LM-1564 800/228-0530	76	68	67	60	$409	0.28	90	76	739	Nice display with high refresh rate; short two-year warranty, no on-screen controls.
10 Nanao FlexScan F2-15 800/800-5202	75	76	59	78	$581	0.28	110	87	740	Expensive. Great text quality, but disappointing graphics; Level 2b Plug and Play[1].

[1]Plug and Play Level 1 sends monitor settings to your graphics card; Level 2b adds a bidirectional capability between your graphics card and monitor.

BEST BUY

Methodology We tested the monitors at a resolution of 800 by 600 dpi, set at 65,536 colors and a vertical refresh rate of 70Hz. We used a Micron P90 PCI Powerstation with 16MB RAM and a Diamond Stealth 64 PCI graphics adapter with 2MB of DRAM.

For more information about all products in this table, circle reader service no. 905.

and vivid color graphics. Text quality was average, but the Ultra 15's display of a strawberry pie had our panel of judges drooling. The monitor's on-screen controls were simple to decipher, and its front-panel RGB (color signal) and color temperature dials are particularly useful if you work with graphics.

Best All-Around Display
Best Buy NEC MultiSync SV15 lacks the Princeton's on-screen controls, but it's got the best combination of text and graphics quality.

For the best overall balance of text and image quality, NEC's MultiSync XV15, in second place, is tops. At $460, it's moderately expensive, but both its text and graphics displays wowed our judges.

That said, we recommend the Sony Multiscan 15sf, in fifth place, over all the other monitors here if you spend most of your workday staring at 8-point Arial in a spreadsheet. The Multiscan's tight 0.25-millimeter stripe pitch (0.28 is considered the minimum dot pitch for crisp display on a 15-inch monitor) earned it a perfect score for text quality.

Viewsonic's 15GA, in sixth place due mainly to its high price ($525), is the only Top 10 unit that came with a built-in microphone and speakers—nice multimedia extras you'll see appearing more frequently.

Monitors are slowly incorporating support for the VESA DDC Plug-and Play specification. Three in this Top 10—the ViewSonic 15GA, Samsung's SyncMaster, and the Nanao FlexScan—come with support for Level 2b, which means that they can exchange information bidirectionally with your graphics card to automatically establish optimal settings, such as the refresh rate.

So far, graphics cards support only Level 1, a less efficient way of synchronizing information between monitor and board. But look for cards with higher levels of DDC compliance to become available soon. (For more on DDC, see the sidebar on page 262 of the September *Top 10 Windows Accelerators*.)

A low graphics score and a high price ($581) landed the Nanao in last place. But its text quality is fine, and if your video card supports it, the Nanao's 110Hz refresh rate should make a big difference in how your eyes feel after a long spell at the computer.

Of the monitors tested that didn't make it into the Top 10, one stood out: Portrait Display Lab's 15 Plus. Its $599 street price knocked it off the chart. But we were impressed with its ability to rotate, a handy option if you need to see an entire page at once.

—Charles Seiter

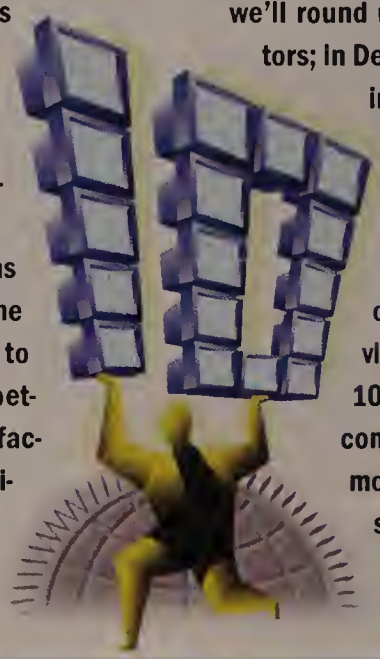
Charles Seiter is a contributing editor for Macworld. *Testing performed by Susan Silvius of the PC World Test Center and John Goddard, staff editor.*

How We Tested: Ratings Weighted for What Matters Most to 15-Inch Monitor Buyers—Display and Price

Whether you're shopping for a replacement monitor or looking for an alternative monitor for a new PC, take along our new Top 10 chart. It lists the most important features to look for and rates how well the units we tested display text and graphics.

Ratings fall between 1 and roughly 85; the higher the number, the better. For 15-inch monitors, text and graphics quality each make up 20 percent of the overall rating; design and ease of use are 25 percent; price is 30 percent; and support policies are 5 percent. We rated text quality by asking a panel of five *PC World* judges to grade a spreadsheet and a screen filled with 48-point serif capital *E*'s. Graphics quality was graded using two color photographs and a white screen (for brightness uniformity). The feature design/ease-of-use rating takes into consideration Plug and Play, refresh rate, and ease of setup.

We also conducted objective instrumentation tests based on Video Electronics Standards Association guidelines. We had intended to combine these results with our subjective text and graphics ratings, but we ultimately dropped this idea. The objective and subjective tests rarely jibed: Our judges sometimes loved a display that delivered less-than-stellar numbers in the instrumentation tests.

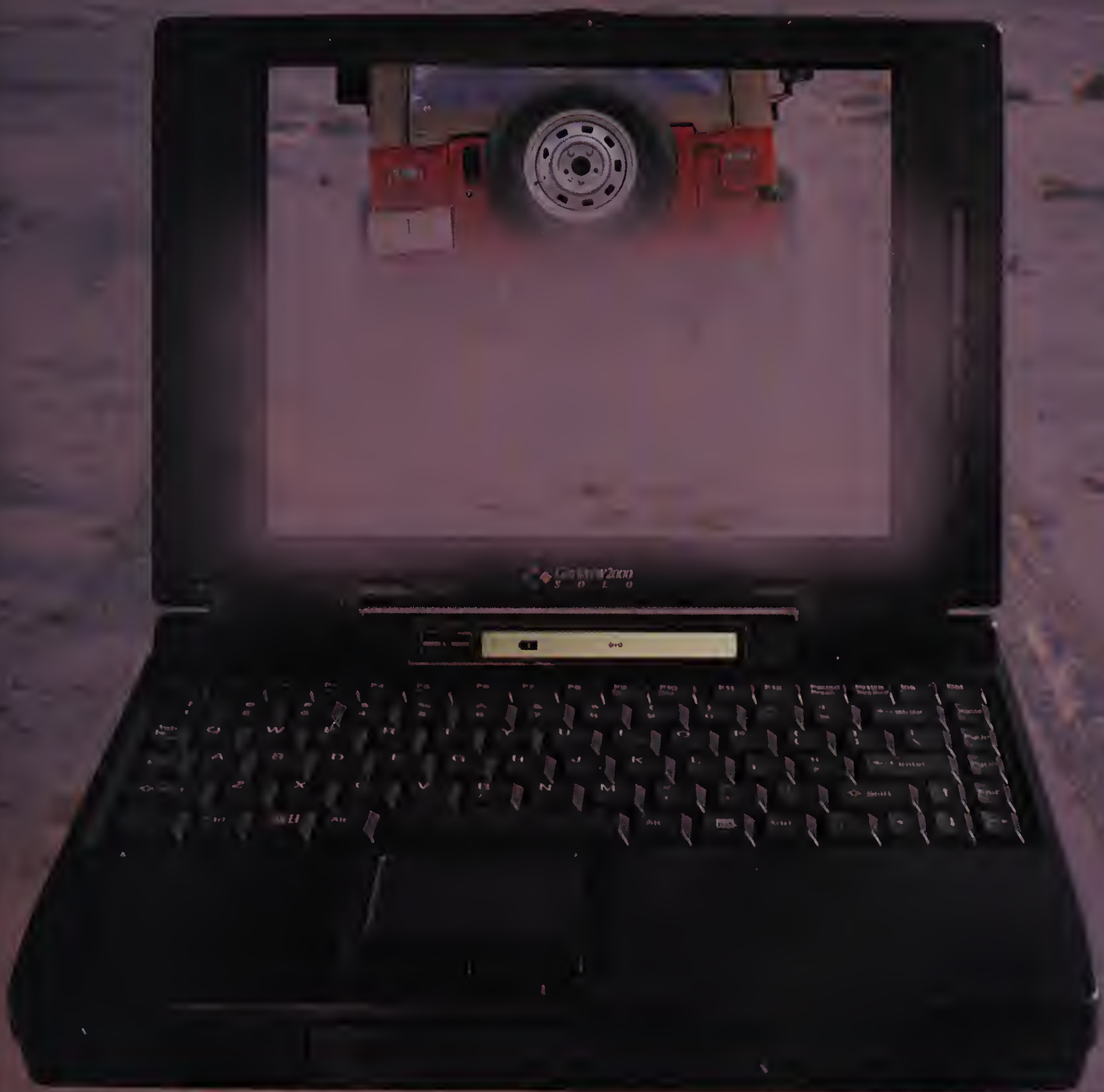


There are several reasons for this. Theoretically, the closer a monitor adheres to VESA specifications, the better its display. But many factors—the application, ambient lighting, and how a monitor is built—affect what you see on screen.

The bottom line: We continue to test monitors' instrumentation, but use it mainly to weed out units with obvious problems.

Every other month, we'll review the latest 15-inch monitors, alternating with coverage of 17- and 19-inch units. Next month, we'll round up the newest 17-inch monitors; in December, we'll update this 15-inch rating; and in January, we'll look at 19-inch models. For each Top 10, we'll review a batch of new monitors, compare them to those of that size we've already reviewed, and produce a new Top 10. One caution: Don't try to compare overall ratings across monitor sizes—we will weight results differently for each size of monitor, so the ratings won't be comparable.

Think Of It As An All-Terrain Vehicle...



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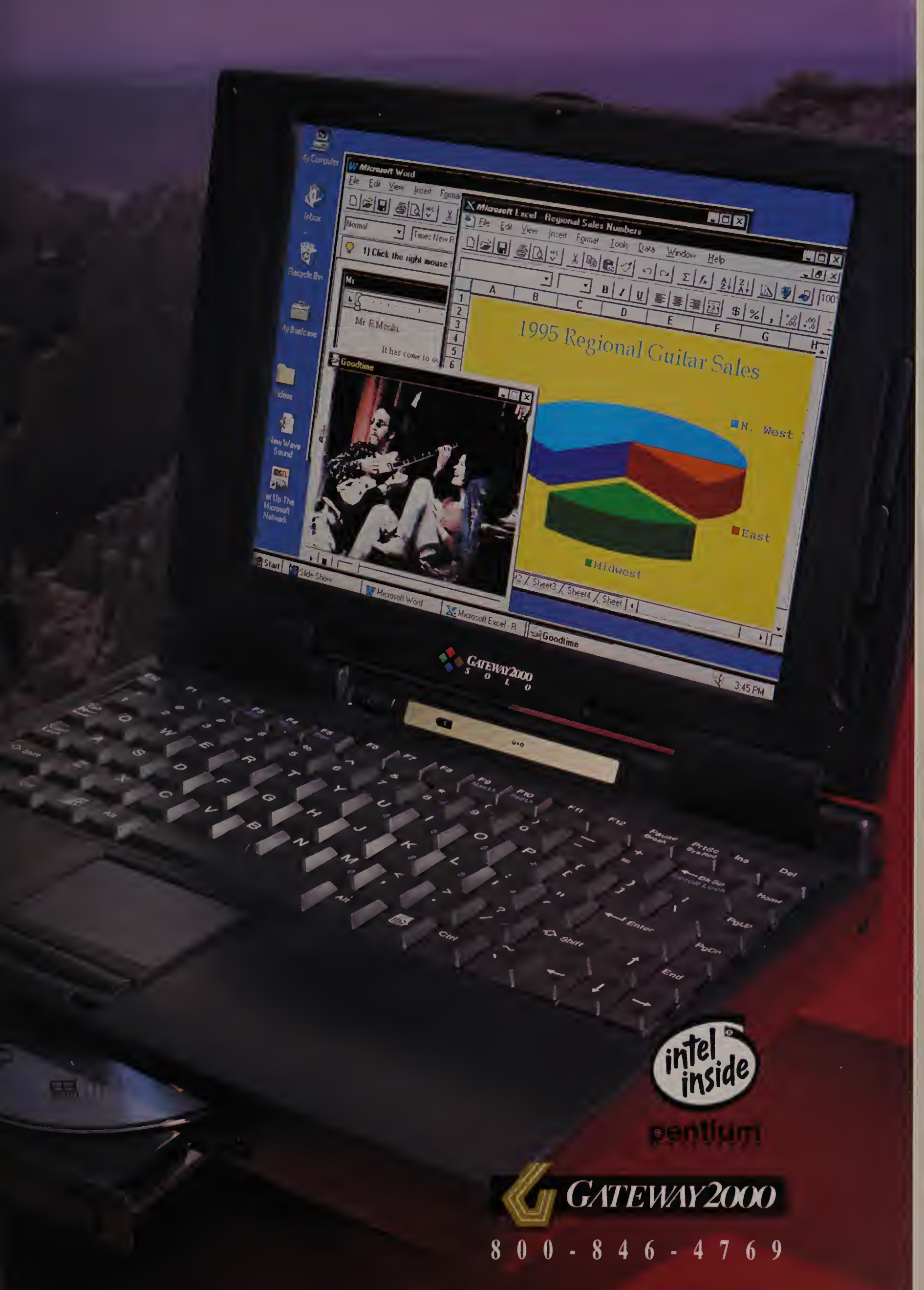
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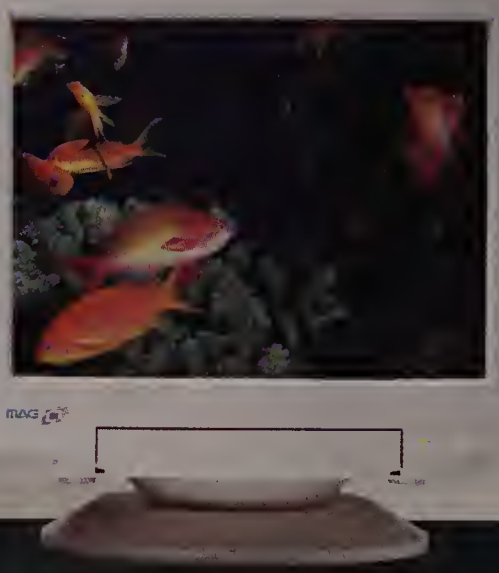

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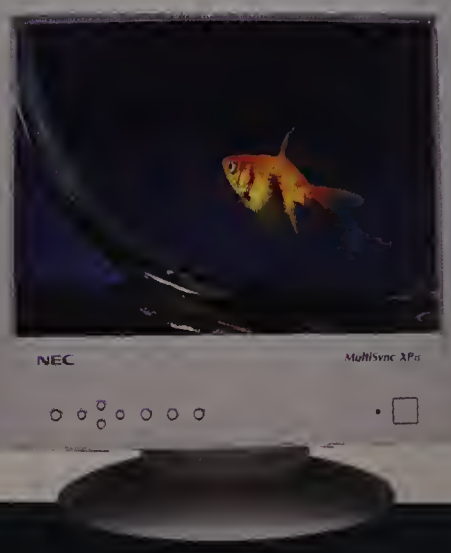

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MAG INNOVISION

GrafixStar Shoots Past the Competition

Video Boards Take Over
VideoLogic's GrafixStar 700 brings to eight the number of boards in the Top 10 that feature built-in full-motion video acceleration.

Of the six new boards we tested this month, only the $349 VideoLogic GrafixStar 700 earned a spot on our list (number eight). It uses the VRAM-based S3 Vision968 video chip and features the VESA Media Channel (VMC), which lets you attach an MPEG card or a TV tuner through a high-speed connector. As of now, though, VideoLogic is the only vendor to embrace the new technology, so your options are limited. We also tested the $229 GrafixStar 500, which has VMC and uses the slower DRAM-based Vision868, but its lower performance ratings kept it off the chart.

Two boards from Number Nine missed the Top 10, including the 2MB VRAM version of the powerful Imagine128. Its $529 street price (down from $849 for the 4MB version), is still too high despite the board's impressive performance rating of 80, but keep it in mind if you plan to do high-end graphics. Number Nine's 9FX Vision330, a solid $199 board for business users, just missed the Top 10, mainly because its overall performance rating of 68 was the same as that of boards costing $20 to $30 less.

Rounding out this month's contenders: The Elsa Winner 1000AVI comes with excellent software for installing and configuring the board, but an overall performance rating of 67 didn't justify its $299 price tag. The $189 Cardex A2000/V, on the other hand, is a faster video accelerator, but its poor documentation and spotty software utilities kept it off our Top 10.

—Brad Grimes

WITS (Windows Integrated Test Suite) was developed by Jon Peddie Associates, a PC graphics consulting firm. Brad Grimes is an associate editor for PC World.

TOP 10 ACCELERATORS

Last month		First reviewed	Street price	Overall rating	Performance ratings: Business applications	Performance ratings: Graphics applications	Service and support rating	Installed/maximum RAM (MB)/type	Reader service no.	Comments
1	Diamond Stealth64 Video 3200 800/468-5846	1	Sept 95	$254	85	83	85	77	2/2 VRAM	713	Top performance, utilities and docs; MPEG software; weekend support.
2	STB Velocity 64V[1] 800/234-4334	2	July 95	$299	81	79	80	78	2/4 VRAM	714	Good performance; MPEG software; lifetime warranty and toll-free support.
3	Paradise Bahamas 64 800/568-9272	3	Feb 95	$169	79	67	72	85	2/2 DRAM	715	Low price; five-year warranty, toll-free phone support, and weekend support.
4	Diamond Stealth64 Video 2220XL[1] 800/468-5846	4	July 95	$233	78	71	80	77	2/2 DRAM	716	Solid software and video features; MPEG software; weekend support.
5	Matrox MGA Millennium[1] 800/361-1408	5	July 95	$329	78	74	85	55	2/8 WRAM	717	Fast graphics; 3-D acceleration, MPEG software; no VL version.
6	STB Powergraph 64 800/234-4334	6	Feb 95	$180	77	66	76	78	2/2 DRAM	718	Good price; five-year warranty and toll-free phone support.
7	ATI Graphics Xpression[1] 905/882-2600 ext. 1	7	Sept 94	$174	77	64	77	64	2/2 DRAM	719	Low price, good software; first chip to integrate video.
8	VideoLogic GrafixStar 700[1] 800/578-5644	–	current	$349	77	78	79	63	2/4 VRAM	720	Good performance, VESA Media Channel and MPEG software.
9	Diamond Stealth 64 DRAM 800/468-5846	8	May 95	$206	77	68	78	77	2/2 DRAM	721	Solid performance and good utilities; weekend tech support.
10	Number Nine 9FX Motion 771[1] 800/438-6463	10	July 95	$349	77	80	82	63	2/4 VRAM	722	Scorching performance and top-notch utilities; no toll-free phone support.

[1]Includes video acceleration on board. Windows 95–certified Plug and Play.

BEST BUY

Methodology PCI boards were tested at 1024 by 768 resolution and 256 colors and at 800 by 600 resolution and 16.8 million colors. The business applications rating consists of WITS scores for Word 2.0, Excel 4.0, and Freelance Graphics 2.01 running in 8-bit mode, plus a score for Freelance running in 24-bit mode. The graphics applications rating consists of WITS scores for CorelDraw 3.0, PhotoStyler 1.1, and QuarkXPress 3.11 running in both 8-bit and 24-bit modes. The overall rating balances performance, street price, features, and support policies. The service and support rating is based on a vendor's warranty, support hours, toll-free support, and online availability.

For more information about all products in this table, circle reader service no. 904.

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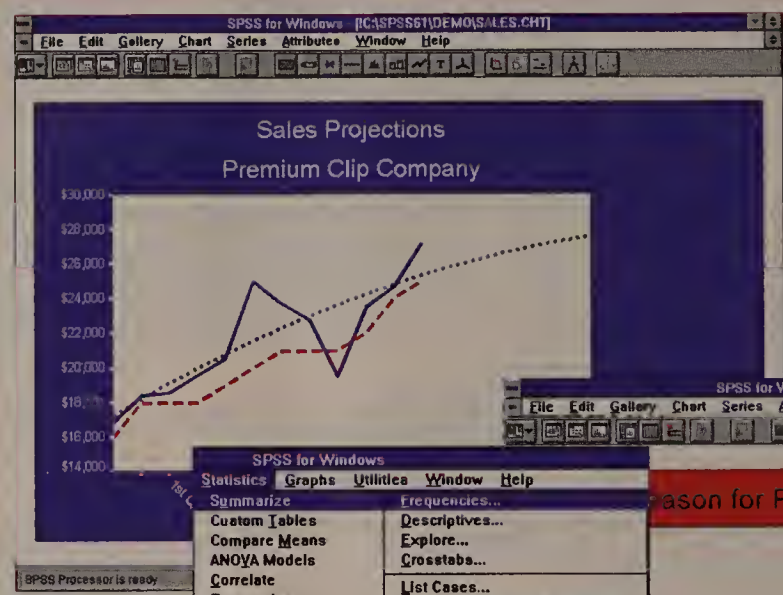

In-depth statistics

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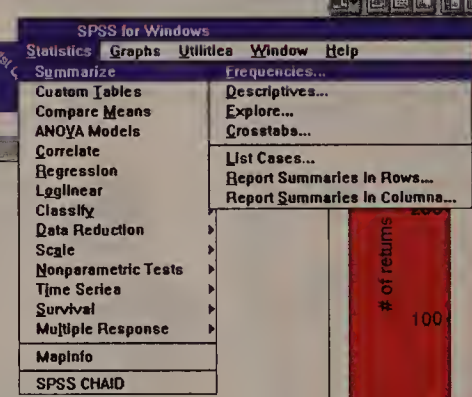
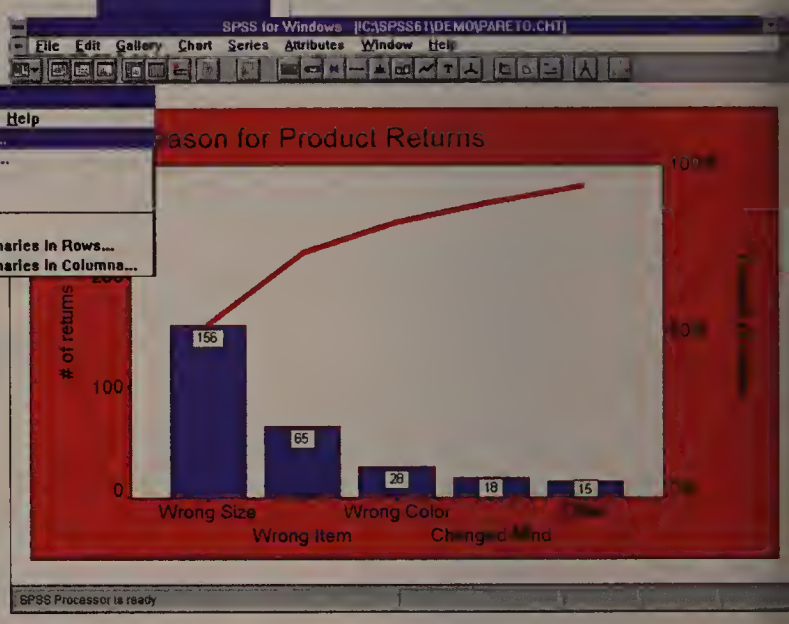
PC MAGAZINE EDITORS' CHOICE May 11, 1993 SPSS 5.0/Windows





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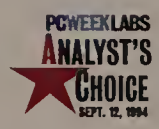

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ELECTRONIC Commerce

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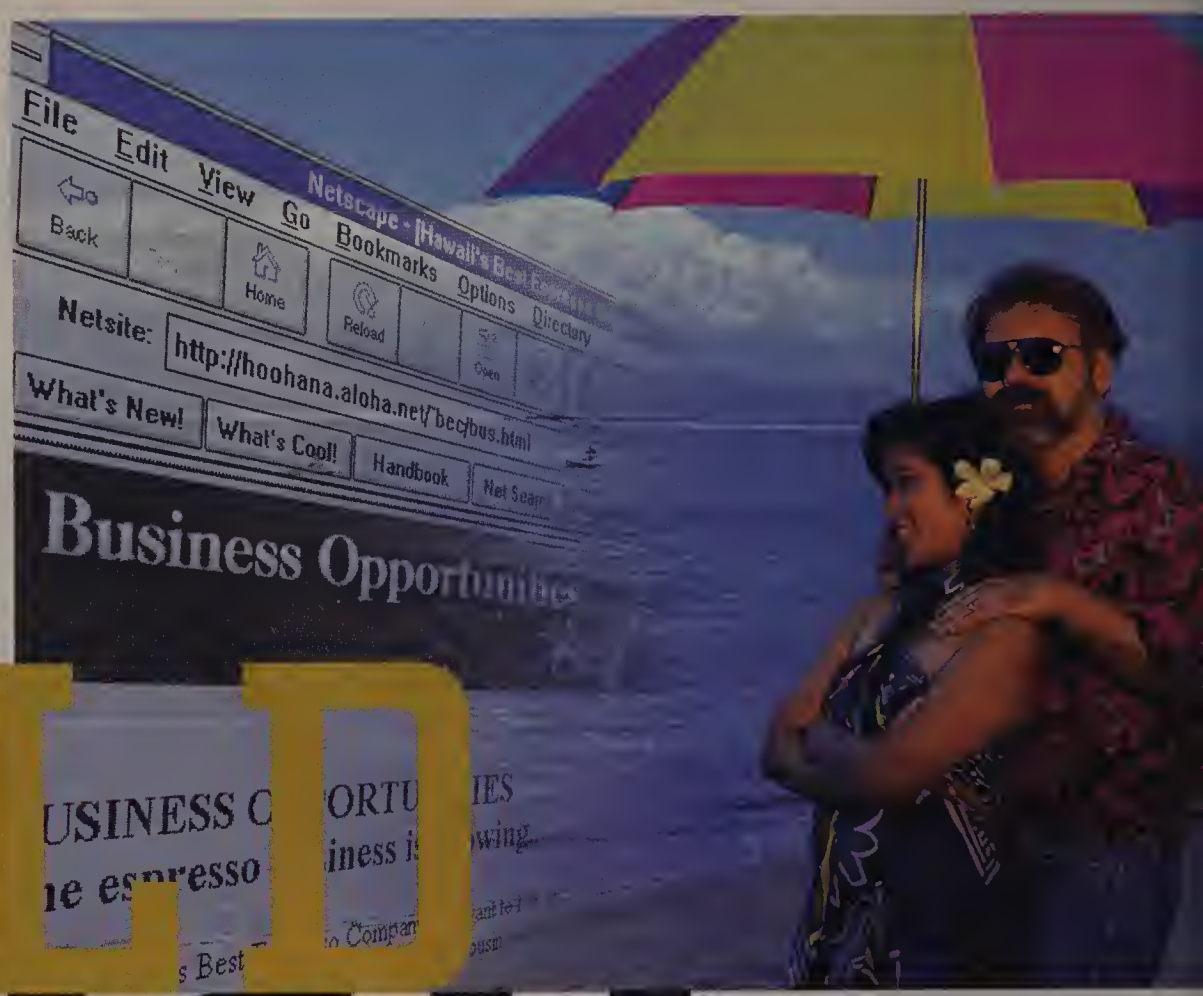

GOLD RUSH ON THE DIGITAL FRONTIER

by **Roberta Furger**

With meteoric growth predicted for the next five years, electronic commerce will revolutionize the way we do business. Is it time to stake your claim?

A YEAR AGO, Bob and Arminda Alexander were working 16-hour days running a coffee store on Maui. They paid $6000 a month in rent for a 400-square-foot spot on Front Street in Lahaina, a prime tourist spot. By all accounts, things were going well. Then Bob discovered the Internet.

"After exploring the Internet for three days, I thought, We could put the shop online," recalls Bob. And for $1000 in design and setup fees and $200 a month to a firm to manage their home page, the Seattle natives did just that. The business, Hawaii's Best Espresso Company (http://hoohana.aloha.net/bec/), broke even in less than a month—just about the time the Alexanders' landlord raised the rent on their shop to $7500. "That's when we said, Forget it," says Bob. "We closed up the real shop in favor of the virtual one."

The Alexanders now work about 4 hours a day on their online business; they have started a consulting practice for other small businesses interested in launching sites on the World Wide Web (where most of the action on the Internet is happening today); and

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Coffee achievers Bob and Arminda Alexander packed up their espresso maker and established a beachhead on the Web.

they're finally able to enjoy paradise.

Stories like these are enough to make even the most cyberphobic businesspeople want to rush out and set up their own home pages on the World Wide Web. And businesses as diverse as Kodak and Ragu, Volvo and the Atlanta Chili Company, have already done so. There's a virtual gold rush going on, with hundreds of businesses—large and small—launching home pages every day.

Indeed, electronic commerce, a catch-all term for doing business online, is all the rage, with analysts predicting meteoric growth in online transactions over the next five years. According to the Business Research Group, a market research firm in Newton, Massachusetts, $20 million in Internet transactions took place in 1993; by the year 2000, BRG expects that figure to reach $30 billion.

But not all the early entries are successes. Scott and Beverly Smith went online with Beverly's Home Crafts (http://www.teleport.com/~halfmoon/craft.html) last February, selling homemade puzzles and crafts. Like the Alexanders, the Smiths believed the Internet offered a more economical way to expand their business than catalog sales or other forms of direct marketing. However, though their home page averages about 15 visitors a day, no one has placed an order.

"We've had compliments on the page, inquiries about where to get catalogs, and requests from people who want to link their page to ours," says Scott Smith, "but no one has ordered a puzzle. It's very disappointing."

No Place Like Home

For some companies, a home page is strictly a marketing vehicle—a convenient, quick way for current or potential customers to get information on products and services. For others, a home page is a new channel for transactions, whether it's selling coffee beans to consumers or custom bottle openers to firms looking for a gadget to sport their name and logo.

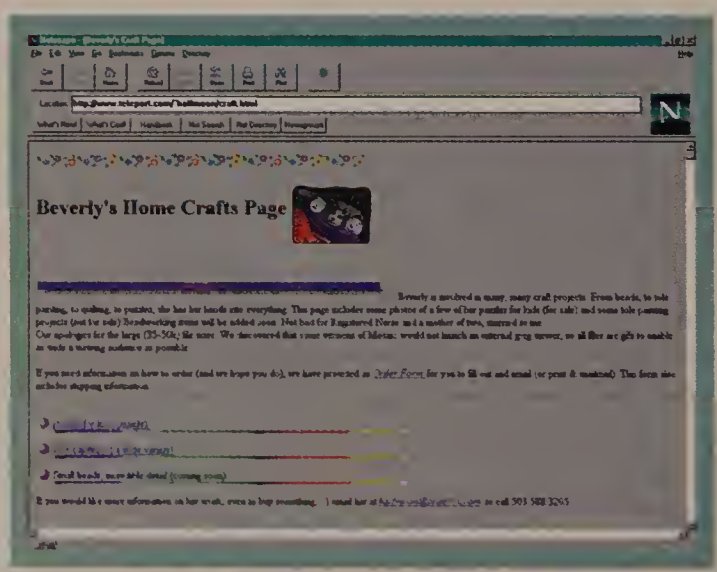
Success is often measured in "hits," or how many people visit a site each day. In the long run, though, says Jerry Michalski, managing editor of *Release 1.0*, a high-tech newsletter published in New York, the real online success stories will be the companies that "rethink their relationships with their customers." Federal Express's site, for example (http://www.fedex.com/), doesn't sport a lot of graphics or entertaining tidbits to entice visitors. Instead, it offers a single extremely useful function: You can track your FedEx package anytime, day or night. Just type in the shipping number and you'll learn where the package was last seen and the hubs it's been through. "It's very cool, very useful," says Michalski.

With thousands of sites to explore, one of the biggest challenges for a business is to distinguish its home page from the competition's and to get it out in front of customers. That means registering with directory services like Yahoo, contacting other businesses about establishing links between home pages, and hoping to get highlighted as a hot spot by a leading Web browser. That's what happened to Hawaii's Best Espresso Company, which hit the big time when Netscape listed its site in the What's Cool section.

Breaking the mold: Technaut Steve Spanoudis manages the home page of Plastics Technology Center.

Playing in the Big Leagues

One of the beauties of doing business on the Internet is that it puts small businesses on a parity with their bigger competitors.



Arts and crafts: Beverly's Home Crafts Page offers homemade puzzles, beads, and paintings.

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Scott and Beverly Smith have had plenty of window shoppers stop by their home page, but no buyers.

"There's the potential to look big but be very small," says *Release 1.0*'s Michalski.

Espresso hawker Bob Alexander concurs. By having a well-designed home page and a good product backed by good service, he says he's able to do battle with other coffee merchants on the Web. So far, big players like Starbucks haven't launched home pages, but Alexander is confident he'll be able to compete with the biggest of them. "The Web puts everyone on an equal footing. That's the beauty of it."

Because people and businesses throughout the world are linked to the Internet, launching a Web site also gives businesses the chance to grow internationally, without opening sales offices on several continents. More than half of Hawaii's Best Espresso's orders are from international customers, according to Alexander, who plans on translating the company's home page into several languages, including Japanese.

Targeting Business

Though the consumer-oriented sites are getting the lion's share of attention, some believe that the Internet is best suited to business-to-business opportunities. Kodak, for instance, has tried to reach both consumer and business markets. It uses beautiful digital images to lure people to its site (http://www.kodak.com/), which includes everything from an annual report to product information for government, education, and other specialized markets. Customers can review literature and pricing, then request a follow-up call from a sales rep.

In January of this year, the Plastics Technology Center, a Lexington, Kentucky–based product design and manufacturing firm, launched its home page (http://www.lexmark.com/ptc/ptc.html). Technical coordinator Steve Spanoudis says it's been an ideal vehicle for showcasing his company's expertise. "Our business is heavily computer oriented," he says. "The Net gives us a way to attract business from companies that are also very computer oriented."

Still Some Bugs

Though many businesses are thriving on the Internet, there are still some serious issues to work through. At the top of the list is security. Try to order products from some online merchants, for example, and you might be greeted with a warning likely to scare off even the most seasoned credit card users: "Any information you submit is insecure and could be observed by a third party." That's a real confidence builder.

Having heard horror stories of computer hackers intercepting credit card numbers, many consumers are fearful of using their cards to place orders over the Internet. As a result, they often limit their activity to browsing and use phone or fax lines to actually place an order. All that will change over the coming months, however, now that Visa and MasterCard have agreed upon a standard for secure credit card transactions. And front-end Web browsers that support the new standard are expected early next year.

Sorting Out the E-Bucks

Despite their current popularity, credit cards won't be the only way to pay for goods and services online. Just as consumers today can choose from multiple forms of payment—credit cards, traveler's checks, cash, and so forth—there will be multiple payment choices in cyberspace. Although so far the schemes involve credit cards, all are mov-

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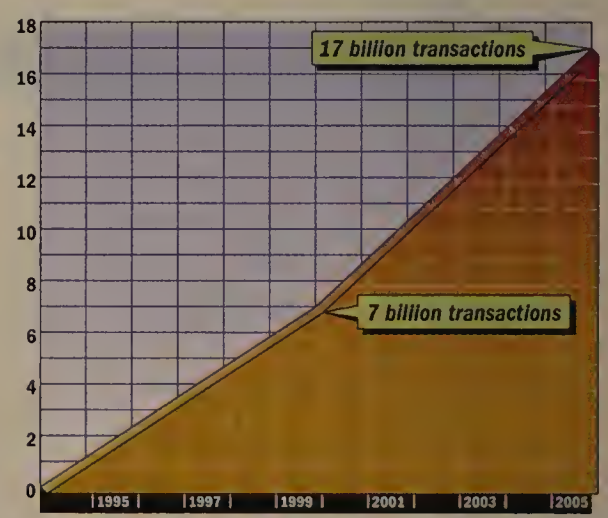

"Phenomenal" is the only way to describe the projected growth of business on the Internet, including retail, wholesale, and distribution transactions. Killen & Associates, a business research firm based in Palo Alto, California, expects Internet-based business to take off in 1995 and soar thereafter.

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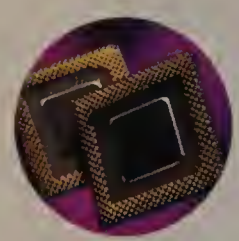
IBM Solution # 28176-T  **a.k.a. "Dual-Processing"**

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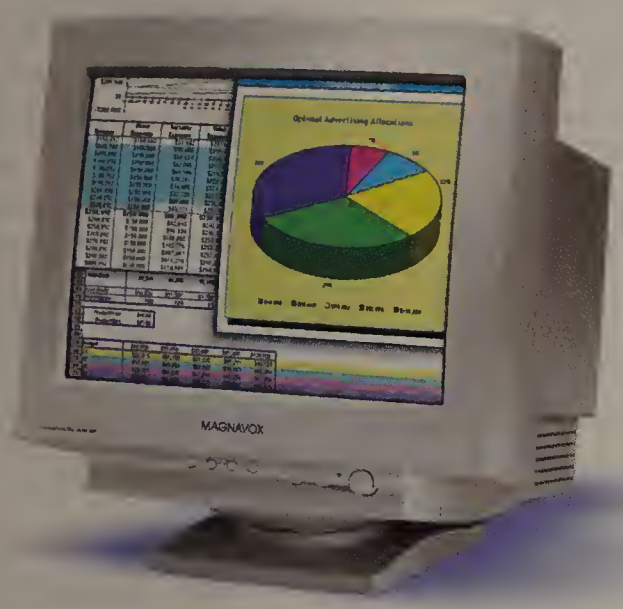

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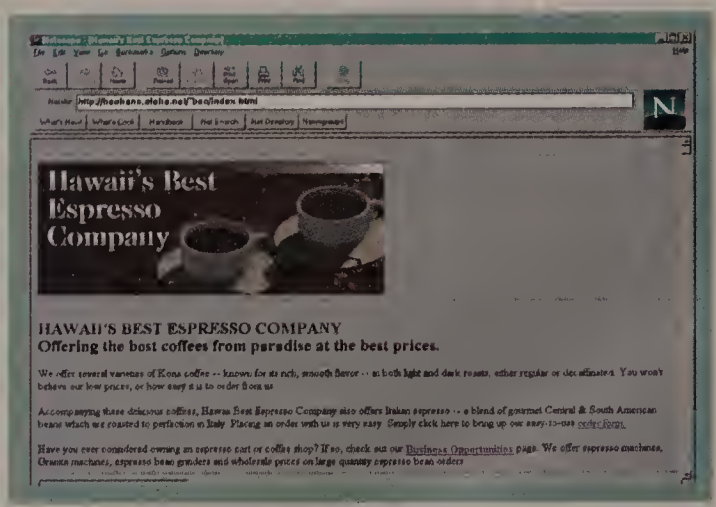

Netscape's What's Cool list landed Hawaii's Best Espresso Company in Kona heaven.

Plastics Technology Center's home page shows the firm's design prowess and computer savvy.

ing toward using a form of electronic cash.

Digicash (http://www.digicash.com/): This system is currently in a pilot stage, with roughly 5000 people signing up for Cyberbucks, the company's own form of currency. Several merchants, including Encyclopaedia Britannica and the Monty Python Shop, display the Digicash logo as an accepted method of payment. The system uses a number code to verify payments, without identifying the owner, explains *Release 1.0*'s Michalski; this makes it both secure and private. Unlike payments made with a credit card, Digicash transactions are anonymous—just like with real cash. Money is issued through Digicash's First Digital Bank, with whom consumers establish an account.

Cybercash (http://www.cybercash.com/): Working with established banks (initially Wells Fargo and the National Bank of Omaha), the Cybercash payment method requires that consumers download special software and open a Cybercash account. Currently, Cybercash transactions are limited to credit cards—consumers sign up with Cybercash, registering their credit card numbers and other relevant information. To order a product, a buyer simply clicks on the Cybercash button (provided the merchant supports this method of payment) and places the order without entering credit card information in a potentially insecure environment. Cybercash, in essence, acts as an intermediary between the merchant and the consumer, verifying and passing payment along to a bank. The company expects to support cash payments by the end of the year. For cash payments, Cybercash will open a separate bank account in a consumer's name with a partner bank. Consumers will specify how much money they want in their Cybercash account, and which of their other bank accounts it should be transferred from. Cybercash accounts require no minimum balance and bear no interest.

First Virtual Holdings (http://www.fv.com/): First Virtual operates on a pay-for-what-you-use philosophy, focusing on buying and selling information rather than hard goods. A buyer downloads an investor report from the Reuters news service, for example, and has a chance to review the information before buying. First Virtual monitors purchases and closes accounts of those who don't pay. Anyone can enroll; First Virtual uses the credit card system, via First USA Bank, to pay information providers.

The CheckFree Wallet (http://www.checkfree.com/wallet.html): Working with Spyglass, Tandem Computers, and Virtual Open Network Environment Corporation, CheckFree has developed a payment system using its existing bill paying network to process credit card transactions; cash transaction support is in the works. CheckFree has also announced specialized Cybercash and CompuServe wallets. The CheckFree Wallet standard must be supported by the consumer's browser and the merchant's server software.

Getting There From Here

Slowly, the pieces are being put in place to make thriving electronic commerce a reality. But huge gaps between expectations and reality still exist. Does that mean businesses should wait until all the snags get smoothed out? Not a chance, says Michalski. "Over the next five years, having a home page will be just like having a fax machine was in 1990–91. You better be there if you expect to stay in business."

Roberta Furger is senior writer for PC World. *Rod Kuckro, editor in chief of the* Report on Electronic Commerce *newsletter, contributed to this article. Michael S. Lasky is a senior associate editor for* PC World.

IMMINENT DOMAIN

"Location, location, location!" used to be the three most important requirements for a successful business. But how does a business establish its Internet address—its *domain*, in Net lingo? It's not as difficult as you might think.

The first step is to register the name of your node. (A node is basically a computer with a full-time connection to the Internet.) Each node has a unique address, such as our own *pcworld.com*. To stake your name claim, you need to register it with InterNIC (http://www.internic.net/). The site includes complete instructions and registration templates. There is no fee to register a domain or node.

A company or an individual can also establish a domain through an Internet service provider that rents space on its system and offers addresses that look like independently established nodes. Providers' domain services are usually part of comprehensive turnkey services that include design and maintenance of World Wide Web sites. Visit the Web sites of Netcom Online Communication Services (http://netcom.com) and Web Communications (http:// www.com), two of the largest providers, to get an idea of their fees and range of services.

—Michael S. Lasky

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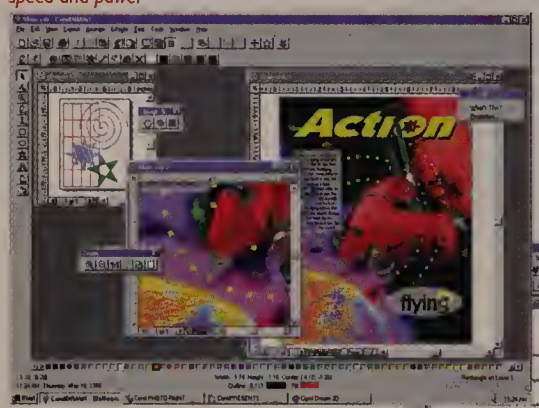

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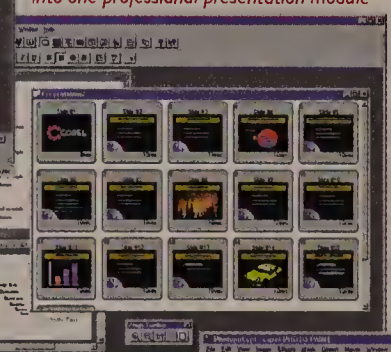

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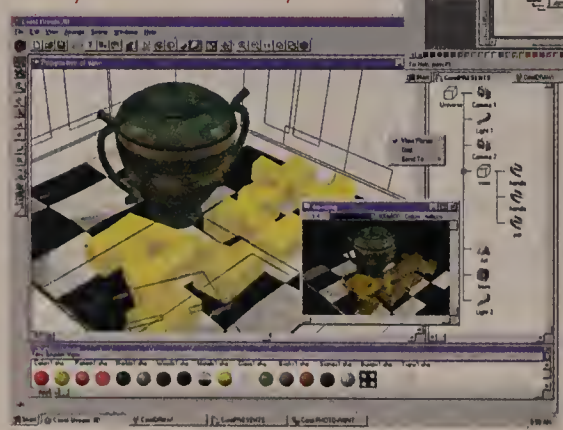

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FAST TRACK TO ONLINE PROFITS

by **Rod Kuckro**

America Online, CompuServe, and Prodigy, unlike the Internet, now offer secure shopping and 8 million paying customers.

THE INTERNET may be tomorrow's hub of electronic commerce. But today, the real action is on the "big three" commercial online services—America Online, CompuServe, and Prodigy. Of the estimated $362 million worth of merchandise sold electronically last year, a whopping $325 million was sold on commercial online services. That leaves a paltry $37 million to be divvied up among the Internet, multimedia kiosks, CD-ROMs, and interactive television. If you're seeking an electronic commerce success story, the online services—with growing user bases and built-in mechanisms for secure transactions—are a great place to look.

In the past year, the big three added more than 2.5 million users. Today nearly 8 million people subscribe to a service—and that number is expected to grow at a rate approaching 35 percent a year, according to *Information & Interactive Services Report*, which conducts a quarterly census of consumer online services.

CompuServe, a subsidiary of H&R Block, has made online shopping a centerpiece of its service. Its 12-year-old Electronic Mall hosts more than 170 merchants. CompuServe, which has 3 million members, won't divulge its revenues from the mall. According to a company spokesperson, though, over the last five years mall visits have, on average, increased 78 percent annually, and orders have increased 50 percent each year. In addition to annual fees starting at $10,000 per electronic storefront, CompuServe charges mall merchants a 2 percent

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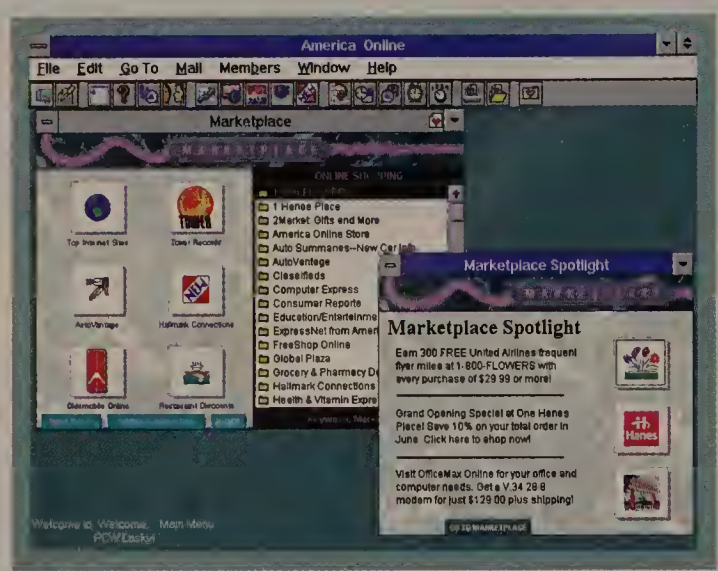
commission on goods sold online. Members can visit the mall for an additional charge to their basic monthly membership fee.

This fall, CompuServe plans to expand its mall to the 30 million users of the network of networks, the Internet. The CIS Internet Mall, which will be found on the graphical World Wide Web, will let vendors create enticing storefronts that take advantage of the Web's snazzy graphics, audio, and video capabilities—a huge improvement over CompuServe's current text-based interface. CompuServe hopes to have 50 merchants in the mall by year's end, says Keith Arnold, general manager of the company's electronic mall group. Already, current CompuServe mall merchants such as Lands' End, JC Penney, FTD Direct, Hammacher Schlemmer, Hyatt International, and Service Merchandise are looking at making the jump. The service can lure members and nonmembers to the Web mall, and CompuServe, which will manage the mall, will take a commission on all sales.



AOL's marketplace continues to expand with local and national brand-name vendors.

More Credit to You

The major roadblock to commercial transactions on the Internet is security, something the online services have never had to worry about because they are proprietary and self-contained. While each service handles credit card transactions differently, all can provide secure transactions starting with a user's first log-on and registration, when credit card information is collected.

Prodigy uses a subscriber's credit card number as a default for all transactions—be it monthly charges or online purchases. On America Online and CompuServe, members can change credit card information at any time and use a different credit card for purchases, but they must re-enter credit card information with each transaction.

While it may be months before a significant number of CompuServe mall stores open branch offices in the Web mall, the company already is looking at how to distinguish itself from the large number of shopping ventures currently springing up on the Internet. One of CompuServe's first steps was to purchase Spry, maker of the popular Internet In A Box and Mosaic browser software. CompuServe members can use a customized version of Spry's Mosaic that connects directly to the CIS Internet Mall. CompuServe anticipates that other Web sites will add hot links pointing to the Web mall, and the company's own CD-ROM magazine will include links that send customers to exact addresses within the mall, just by clicking on an icon. The service now also offers its Internet Office Web Server, which supports all secure Web browsers.

The Prodigy service has a mall, too, and was among the first to offer advertising online. The service, a joint venture of IBM and Sears, now charges $100,000 for five screen "pages." Prodigy has not announced any plans to move its mall to the Internet, though it became the first online service to offer easy access to the World Wide Web late last year—resulting in large membership gains.

Prodigy has been the most aggressive of the big three in connecting merchants with members. Almost every Prodigy screen has a place for an advertisement. Members can click on the ad for instant access to the merchant's site.

Another option for Prodigy merchants who want member attention is E-mail advertising. An electronic version of third-class direct mail, Prodigy's graphical E-mail comes with a button that links interested members directly to the merchant's online location.

America Online is developing distinct sites for corporations that want to reach a target audience, such as ExpressNet, which was created for American Express. That site, the first of 24 planned by AOL, allows American Express cardholders to make travel reservations, check credit card balances, pay bills, and purchase traveler's checks and foreign currency electronically. These custom sites complement the ever-increasing number of storefronts in the AOL Marketplace. High-profile marketers and merchants with stores in the AOL Marketplace include Hallmark Cards, Tower Records, OfficeMax, and Hanes.

Exploiting the Internet

Online services have realized that they not only must coexist with the Internet and its powerful World Wide Web—they must also find ways to use the Net to their advantage. For a start, they have become viable Net access carriers with built-in browsers for seamless Web connections.

Locking in a larger audience makes the services more attractive for marketing to consumers and businesses, especially since, unlike Internet users, online service members pay monthly fees for entry. Marketers are gaining access to consumers who *want* to visit their online stores and are willing to pay for the privilege in a secure environment.

Catalog giant Lands' End reaps extra sales with its secure Prodigy shopping site.

Rod Kuckro is editor in chief of the newsletter Report on Electronic Commerce.

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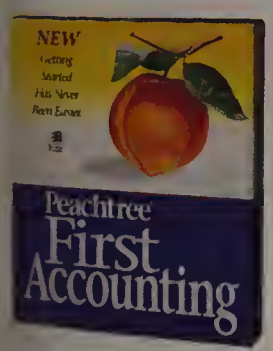

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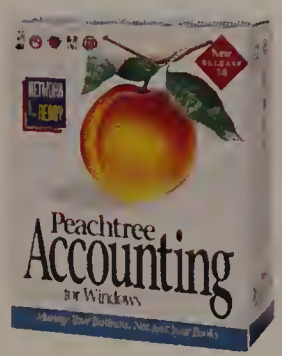

Others said they wanted a lot more from their accounting software than just the basics. They asked for business-building features to help them grow, and maximum flexibility. That's where Peachtree Accounting for Windows comes in. It expands beyond the basics like GL, AP, and AR to add full-featured inventory and payroll, plus powerful features that can help you run your business a lot more professionally. A report writer and forms designer. Contact management features so you stay on top of accounts. And the Manager's Series, which lets you conduct "what-if" scenarios. All for only $129.

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TOP WEB SITES FOR ONLINE BUSINESS

by **Vince Emery**

CommerceNet

http://www.commerce.net

CommerceNet provides guidance about how companies can take advantage of the Internet. (Look under the heading "Reference Information" for background on dozens of ways businesses can use the Internet.) Check out the directories of electronic business consultants and access providers, or browse the entire site from the text-only index.

IndustryNET

http://www.industry.net

This is a huge online mall where hundreds of manufacturing and wholesaling companies sell new and used industrial products such as engineering software, process equipment and instrumentation, test and measurement equipment, and advanced manufacturing systems; you'll also find news and information. Registration at this business-to-business site is free.

Premenos

http://www.premenos.com

Billing itself as "The Electronic Commerce Resource Guide," Premenos is the place to go for information about electronic commerce and Electronic Data Interchange (a method for passing purchasing, inventory, and shipping information between computers). It offers linked access to network providers, electronic commerce publications, and Internet resources, as well as an up-to-date calendar of offline business events around the world.

Business Sites

http://www.rpi.edu/~okeefe/business.html

This frequently updated list of Web sites offers miniprofiles of Net success stories. The site is maintained and organized by Bob O'Keefe, a professor at Rensselaer Polytechnic Institute's School of Management, and limits itself to a select 50 or fewer links.

Mouse Tracks

http://nsns.com:80/MouseTracks

New South Network Services, a network provider, provides this catalog of great resources for both online and offline marketing, advertising, and retailing professionals—all served up with a sense of humor.

Rutgers Accounting Web

http://www.rutgers.edu/Accounting/raw.html

Part of the International Accounting Network created by Southern Cross University in Australia, this Rutgers University site provides easy access to online accounting, finance, and tax information from all over the world.

FINWeb

http://riskweb.bus.utexas.edu/finweb.html

The University of Texas prepares this regularly updated directory of dozens of well-described Web sites dealing with finance, economics, and investments.

Yahoo Business Directories

http://www.yahoo.com/business

One of the most up-to-date catalogs of businesses on the Web. You'll find everything here: lists of consortiums; electronic commerce resources (sites with information on specific subjects); a catalog of business directories; and information on taxes, intellectual property rights, and other legal issues.

EINet Galaxy's Business and Commerce Directory

http://galaxy.einet.net/galaxy/Business-and-Commerce.html

This well-chosen list of electronic commerce-related Web sites includes topics not usually covered by other business research sites. You'll find useful information on protocols, standards, markets, and business-to-business and business-to-consumer strategies, as well as cross-references to other relevant sites on the how-to's, whys, and wherefores of electronic business methods.

Information Services for Professionals

http://ioma.com/ioma

This is a very useful (but not comprehensive) directory of hundreds of business-related sites run by the Institute of Management and Administration, a publisher of business and management information newsletters. Topics include administration, finance, management, sales and marketing, as well as resources available by specific industry.

Electronic Commerce on the World Wide Web

http://amex.cox.smu.edu/mis/cases/webcase/home.html

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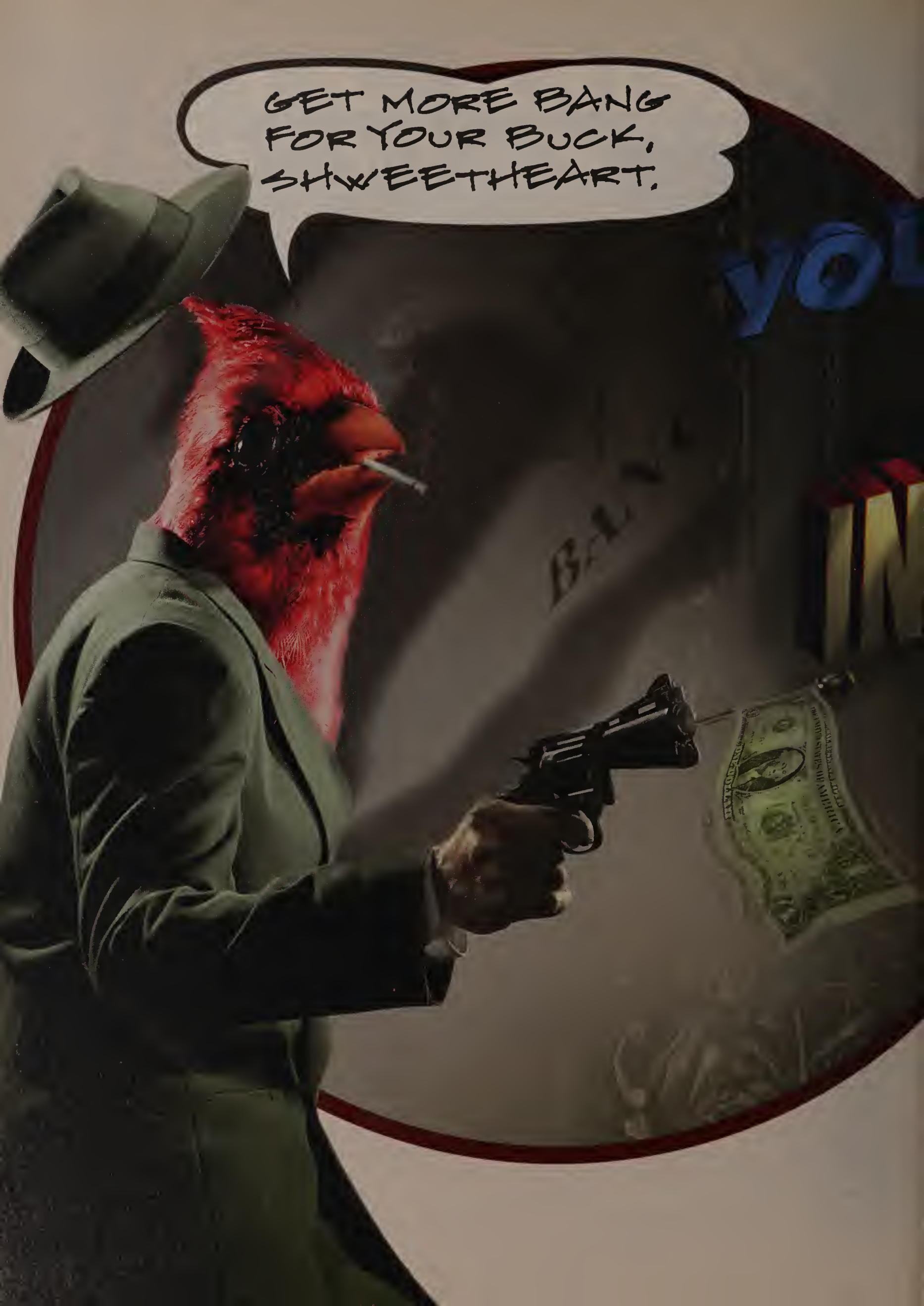
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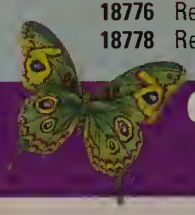

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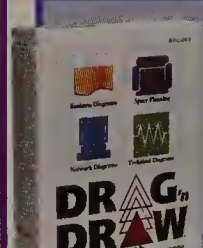

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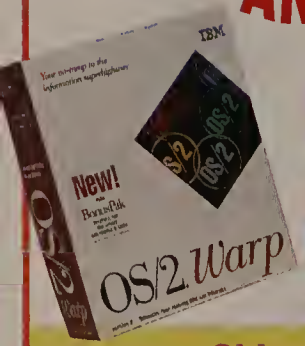

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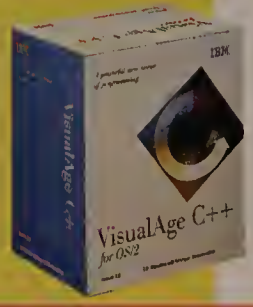

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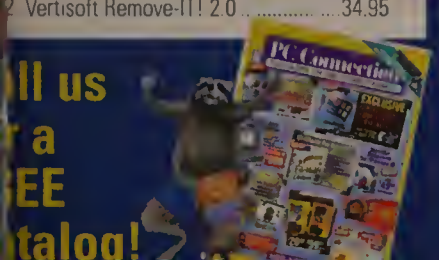

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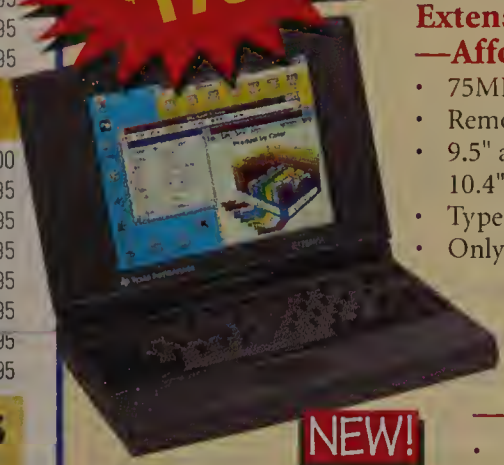

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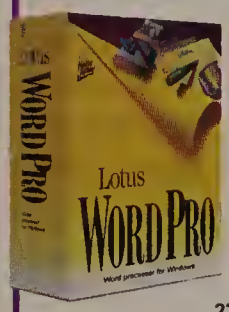

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HELP LINE Q&A

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WHO KNOWS WHERE VIRUSES LURK? Computer viruses don't infect only floppy disks and program files. They can hide on other magnetic and optical media and in any type of file as well. This means you should scan not only your floppies and hard disks, but also your CD-ROMs and rewritable-optical disks. (Of course, since CD-ROMs aren't writable, you won't be able to eradicate any viruses you find on them.) Further, make sure your memory-resident scanner is running when you open any compressed or archived files (those with extensions such as .zip, .arc, and .arj), so it can look over the files within as they are being decompressed.

Note that if you compress a file containing a hidden virus, you are inadvertently making that virus harder for its recipient to find.

Antivirus utilities capable of scanning compressed files include Dr. Solomon's Anti-Virus tool kit from S&S Software Int'l (617/273-7400) and VirusScan from McAfee Associates (408/988-3832). If you work with compressed files regularly, Nico Mak Computing's (800/242-4775) WinZip archive utility can optionally work with many popular antivirus utilities to automate the scanning process.

Shane Rau, Technical Editor

Windows In-and-Out

Q Is there a way to launch Windows, run a Windows application, and open a document all at once? Often I exit Windows and am about to turn my system off when I realize I need a quick look at a document or spreadsheet. So I restart Windows, wait while it loads, load the application, and finally open the file I need. If that application were in my Startup group, which it seldom is, I could save at least one step. Is there a shortcut to this three-step process?

Ruth Neville, Internet

A You bet. First of all, you can always launch any Windows application along with Windows itself by appending the program's executable file name to the win command. For example, typing **win winword** at the DOS prompt starts both Windows and Word for Windows—as long as the winword.exe file is in the current directory, or its directory appears in your autoexec.bat's path statement.

And since Windows lets you associate file types with the applications used to edit them (allowing you to open Word for Windows simply by double-clicking a Word document, for example), it stands to reason that you should be able use a document file name as an argument on the win command line. Sure enough, as long as the document file type is associated with its application in File Manager, you can launch Windows, the application, and the document with the command **win** *file.typ*, where *file.typ* is the name of the file you want to open.

386SX—Still Worth Upgrading?

Q I have a Gateway 16-MHz 386SX PC that I'm considering upgrading with a Cyrix Cx486SRx2 overdrive chip. From what I've read, the chip, which costs about $200, will convert my 386SX-16 machine to a 486SX-33. This kind of upgrade appears to be a little cheaper than buying a new 486 system board. What do you think?

L. Chinsoo Cho, Internet

A That's a tough question. I'm wondering the same thing about the now-ancient 20-MHz 386DX machine I use as a test system: Should I spend a little more on it so it'll run Windows 95 without driving me up the wall, or should I pull its plug?

These 386-to-486 upgrades are certainly tempting, especially if you're on a tight budget. If you're not afraid of opening up your computer and yanking the CPU, you can double its performance in a few minutes—which is a lot easier than swapping the system board.

But before you whip out that credit card, consider this: If you want to run OS/2, Windows 95, or even Windows 3.1 (without pulling your hair out), you need at least 8MB of RAM, a big hard disk, and fast video. If you have to spend another $200 to $300 to upgrade these parts of your aged 386SX, I recommend selling, donating, or trading it instead and spending $1000 or so for a new or used 100-MHz DX4 system. (For not much more than that, you can get a 75-MHz Pentium that will prob-

ably still be useful—and more upgradable—at the turn of the century.)

Another issue is bandwidth. A 386SX has a 16-bit bus, which slows a 32-bit operating system something fierce. Any CPU intended for a 386SX motherboard will also have a 16-bit bus.

A better bet might be Evergreen Technologies' Rev to 486 upgrade, which comes with a larger on-board cache than Cyrix's chip. Prices range from $95 to $469, depending on the machine you're upgrading.

One last thing: Early versions of the 386SX can't be upgraded because they have a different number of pins than standard 386s. Cyrix offers a test program, **srxtest.exe**, on its BBS (214/994-8610) that will tell you if your SX is upgradable or not.

- **Evergreen Technologies;** 503/757-0934
  Reader service no. 759

The Hole (Floppy) Story

Q For years my home computer was an Atari TT. Recently I bit the bullet and bought a 486 PC. For the most part I was able to copy text files from the Atari easily, since the floppy disk format in TOS (the Atari operating system) is the same as MS-DOS's.

But I have one problem: TOS lets you format double-density disks (usually 720K) to 1.44MB. Unlike my PC, the Atari doesn't look for the extra hole identifying the floppy as high-density, so I have a lot of 1.44MB floppies my PC can't access. I debated cutting the extra hole in the floppies but hoped there might be a software solution.

Anthony T. DiPietro,
North Attleboro, Massachusetts

A I'm not aware of a utility that defeats your PC's (actually, your floppy drive's) media-detection mechanism. By all means, though, try cutting a hole in a floppy's plastic casing, and see if it works. What have you got to lose?

I successfully used an X-Acto knife for the job. You could also use a square-hole puncher, available at many computer stores and clone shops. Just be careful to cut the hole in the right spot (use another high-density floppy as a template) and to remove bits of loose plastic that could fall into your drive.

Even if you're a first-rate surgeon, however, you still may not be able to read the disks. A 1.44MB floppy contains a higher concentration of magnetic particles than a 720K floppy. The strength of the magnetic field a floppy drive uses to write data depends on which type of media it detects. If you defeat the drive's detection scheme by punching a hole in the floppy enclosure (or use a system that lacks media detection), the computer will use the wrong amount of current.

You'll be able to write to the floppy, but you may not be able to read it later. In other words, don't start punching holes in the double-density 720K floppies you use for backups and archiving. The only thing worse than no backup is a backup you can't restore.

Schedule+ Intervals

Q I recently upgraded to Windows for Workgroups 3.11 and started using the included Schedule+. I like the program, but I haven't been able to change the default 30-minute appointment block. Most of my appointments last at least an hour, so I have to edit each appointment length manually so it displays properly. Is there a way to change the default setting?

David G. Bartlett,
Kansas City, Missouri

A Schedule+ lets you create an appointment of any length, even one that starts at 11:53 and ends at 11:54. You just have to be willing to type those numbers in the Start and End fields in the Appointment dialog box.

If you just double-click a time, type in a description, and press <Enter>, you're right—Schedule+ makes that appointment 30 minutes long by de-

USER GROUP OF THE MONTH

PC Clubhouse (Northern California)

October's user group tips come from the PC Clubhouse, which meets on the first Friday of each month at California State University at Hayward, Room 2002, Meiklejohn Hall, at 7:30 p.m. PCC offers more than a dozen special interest groups (SIGs) on topics including Windows, OS/2, CorelDraw, databases, and spreadsheets. A 2GB CD-ROM shareware library is available from the Shareware SIG.

The club has several bulletin boards operating at speeds up to 28.8 kbps; all are open to the public. A 12-page newsletter offers reviews, tips, commentary, and SIG reports.

PCC's community project is helping the disabled gain or improve computer skills.

For additional information, contact PCC president Bayle Emlein at P.O. Box 3127, Hayward, CA 94540, or call 510/538-2449. Log on to the club's BBS at 510/581-8529, or visit its Web page, http://www.dnai.com/~kenseq/pcc.html. Membership is $24 per year for adults and $12 per year for additional family members, seniors, and students.

Reader service no. 601

DIRECTORY FILE SIZES: In DOS, find out the total size of the files and subdirectories within a directory with this batch file. Type its name followed by a directory name, and it gives you a report, screen by screen.

```
@echo Reading the directory...
@dir %1 /s|find "t" |more
```

Jan Fagerholm
PC Clubhouse

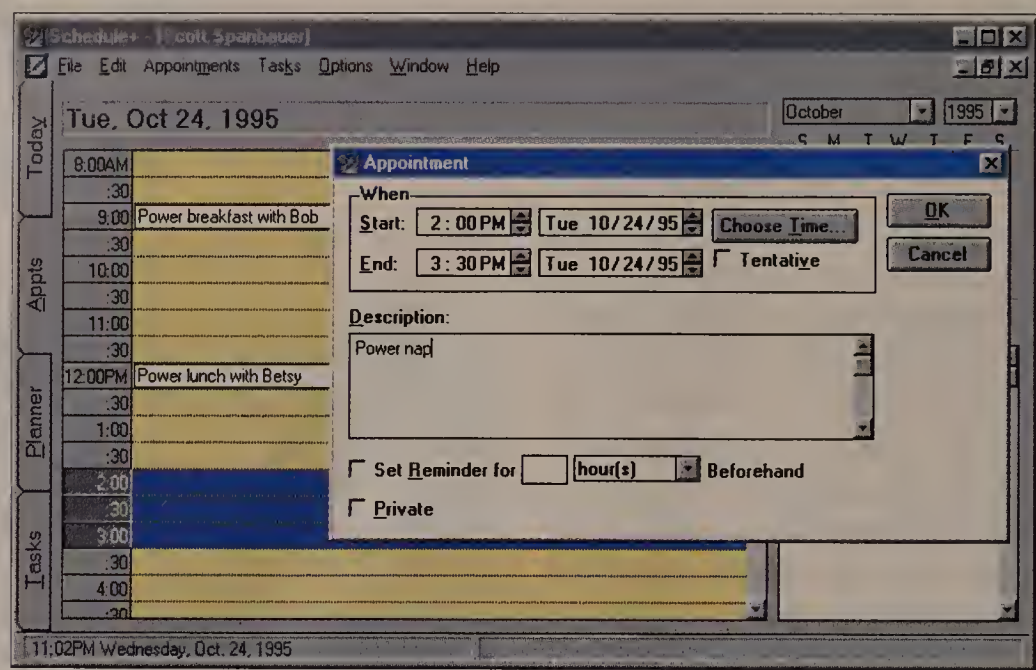

FIGURE 1: CREATE APPOINTMENTS ACCURATELY in Schedule+ (without a lot of tedious typing) by selecting multiple half-hour time blocks first.

fault. Version 2.0, included with Microsoft Office 95 but not with Windows 95, lets you change the time scale displayed to 5, 6, 10, 15, 20, 30, or 60 minutes. However, you have to upgrade to Windows 95 to use it.

If you're not ready to take that leap, you can create longer appointments (in multiples of 30 minutes) in your version of Schedule+ by highlighting the entire appointment length, then selecting *Appointments • New Appointment* or pressing **<Ctrl>-N** (see **FIGURE 1**).

Reading Local Web Pages

Q To create documents for the Internet's World Wide Web, I use the freeware HTML Assistant utility (**ftp://ftp.cs.dal.ca/htmlasst/htmlafaq.html**). When I try to use my regular Web browser, Netscape Navigator, to view a Web page I'm working on (that is, while I'm not connected to the Net, and the files are stored on my computer), it posts an unfriendly error message telling me I need to connect.

Is that true? If so, do you know of any application that will let me view my HTML documents without connecting to the Net—or any way to convince Netscape to let me do so?
Ryan Heaton, Internet

A Even if the HTML editor you use shows what your Web pages look like, it's wise to preview them using the actual browsers that people reading your pages will use. Not all programs interpret HTML codes the same way, and previewing helps you to trap individual browsers' formatting anomalies. And no, you don't need an Internet connection to launch Navigator (or most other Web browsers) and preview documents stored on your system. If the browser uses Winsock—an implementation of the TCP/IP networking protocol for Windows—to create connections to the Internet (most of them do), you do have to load a winsock.dll program (such as the popular shareware Trumpet Winsock) that provides this connection. However, most Winsock dialers let you disable automatic log-ins, which means you can run them without actually reaching out and touching anyone.

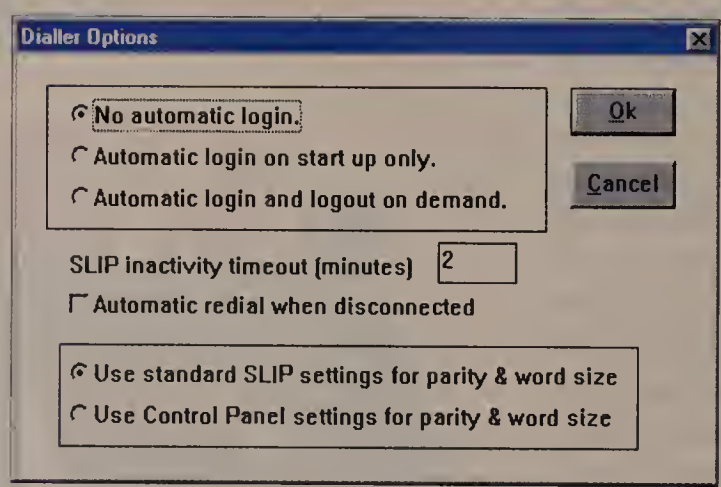

FIGURE 2: BROWSE WEB PAGES LOCALLY by disabling your Winsock dialer's automatic log-in feature.

When you launch a Winsock app such as Navigator, it searches the directories listed in your system's path statement for a copy of winsock.dll. In your case, Navigator can't find your winsock.dll file, probably because you renamed it or removed it from the current path to prevent it from dialing out into cyberspace. Instead, allow the file to load by changing its name back to winsock.dll or by making sure its directory appears in the path statement in autoexec.bat, and disable its automatic log-in feature. In Trumpet Winsock, select *Dialler • Options*, then click *No automatic login* in the resulting dialog box (see **FIGURE 2**).

Once this is all set up and Navigator is running, you can open local HTML documents from the File Open dialog box. You'll still get an error message from Navigator when you start up, because it will try unsuccessfully to load the Netscape home page (which requires an Internet connection). Just press **<Esc>** to skip loading the page and to forestall the error message.

More Good Ideas on Migrating Files

Reader Richard D. Lewis of Manhattan, Kansas, liked my hard disk migration suggestions in the June issue ("Move Over, Little Drive..."), but he has a suggestion of his own. He recommends adding the /v switch (for verify) at the end of the command xcopy d:\ c:\ /s for transferring files from the old drive to the new one. Lewis points out that /v instructs xcopy to check that all files are copied correctly, and it's definitely worth the few extra seconds or minutes it adds to the operation.

By Scott Spanbauer

Scott Spanbauer is a contributing editor for PC World. Help Line *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

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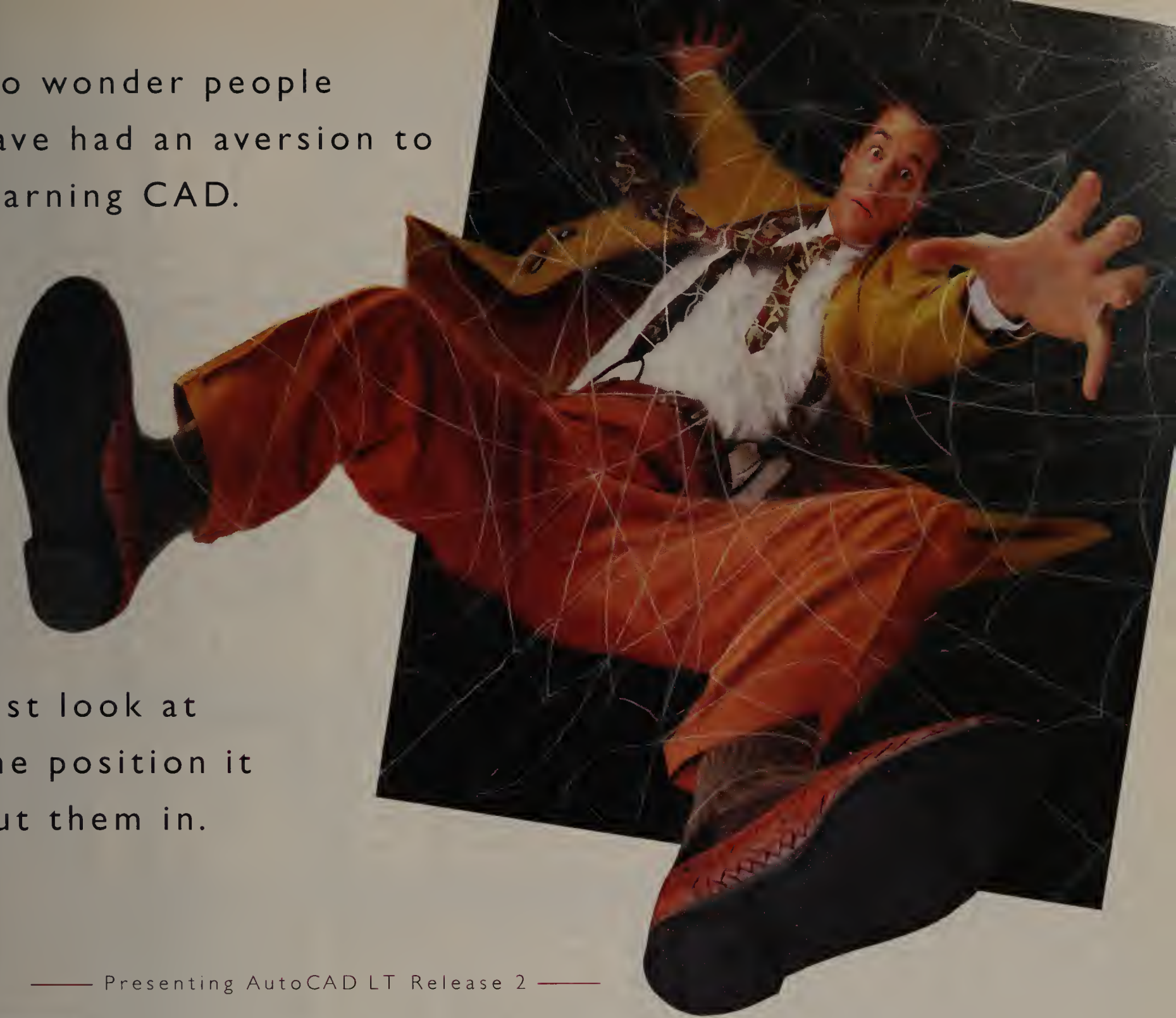

Just look at the position it put them in.

— Presenting AutoCAD LT Release 2 —

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SPREADSHEETS Q & A

Things Are Looking Up

For this month's column, I selected several letters that involve two of the most useful spreadsheet functions—vlookup and choose. Vlookup lets you create a formula that selects an item based on a matching value in a table's leftmost column. Choose picks a value from a list that's contained inside the choose formula. Here are some ideas for handy ways to put these helpers to work in your applications.

Taxing Formulas: Bracket-Rate Calculations in Any Spreadsheet

Q Suppose that I wanted my worksheet to begin with a figure such as $166,000 and then multiply the first $140,000 by 0.44, the next $5000 by 0.45, the next by 0.46, and so on until the $166,000 is used up. Is there a way that this can be done automatically?

Kerry Owens, Internet

A Of course. The calculation that you describe is very common wherever schedules of rates are involved—for example, in tax tables. Since that's an application with which everyone is (depressingly) familiar, I'll show you how to set up a tax table, and then you can substitute your own data.

To set up the model in Quattro Pro or 1-2-3, follow these steps:

1. Enter the values and labels shown in ranges A1..B7, C1..C2, and E2..E4 of **FIGURE 1** below.

2. Enter the formula shown in cell C3 of the figure, **+C2+(A3−A2)*B2**, and copy it to range C4..C7.

A:C3 +C2+(A3-A2)*B2

	A	B	C	D	E	F
1	Bracket Threshold	Rate	Base Amount			
2	$0.00	0.0%	$0.00		Income	$1 000 00
3	$533.00	15.0%	$0.00			
4	$3,588.00	28.0%	$458.25		Tax	$70.05
5	$7,213.00	31.0%	$1,473.25			
6	$12,304.00	36.0%	$3,051 46			
7	$21,713.00	39.6%	$6,438 70			
8						

FIGURE 1: A TAX TABLE is a familiar example of calculations based on bracketed rates.

3. Assign the range name **Income** to cell F2, and then assign the name **Table** to range A2..C7.

4. In cell F4, enter the following:

(income−@vlookup(income,table,0))
***@vlookup(income,table,1)**
+@vlookup(income,table,2)

Excel users should recall that the lookup functions begin numbering the columns of the table with 1, not 0, so the formula in F4 should look like this:

=(income−vlookup(income,table,1))
***vlookup(income,table,2)**
+vlookup(income,table,3)

In the worksheet, the brackets and their rates are laid out in columns A and B. The formulas in column C calculate the base amount for each bracket. For example, **+C2+(A3−A2)*B2** in cell C3 takes the base amount for the first bracket (C2) plus the rate for the second bracket (B2) times the dollars in the second bracket (A3-A2). Now you know why your head throbs so excruciatingly every April 16.

The formula in cell F4 calculates the tax on the income in cell F2. In this formula, the first lookup function, @vlookup(income,table,0), returns the threshold value for the second bracket, $533, from cell A3. Subtracting the threshold value from the income value yields the amount of income in the second bracket. Multiply by the tax rate for the second bracket, @vlookup (income,table,1), to get the tax due for the second bracket. Finally, to complete the calculation, add the base amount for the previous brackets, @vlookup(income,table,2).

For your problem, Kerry, just extend the table, and substitute your values for the tax data, following the pattern shown here.

	A	B	C
1	Threshold	Rate	Bracket Base Amount
2	0	0.44	0
3	140000	0.45	61600
4	145000	0.46	63850
5	150000	0.47	66150

Group Crosstab Categories in 1-2-3

Q I have a table of data in 1-2-3 release 5.0 that I want to turn into a crosstab. One column contains the location of branch offices, and another contains the dollar amounts for each of the branches. The database is in range A1..B12 and starts off like this:

	A	B
1	Branch	Current
2	East	499
3	West	499
4	North	230

I need a crosstab that summarizes the data by branch within ranges of current values, like this:

	A	B	C	D	E
1	Range	East	North	West	Total
2	0 - 499	729	230	499	$1,458
3	500 - 999	0	0	1 404	$1 404
4	1000 - 1499	3,600	0	0	$3,600
5	1500 - 1999	1,900	1,800	0	$3,700

I can't figure out how to do this with 1-2-3's Crosstabs feature.

Andy Lau, Internet

A If you were using Excel, you'd find this feature built right into its pivot tables. But in 1-2-3 releases 4.*x* and 5.0, you have to do it yourself.

First, insert a column between columns A and B of your database, enter the label **range** into the newly inserted cell B1; then enter the formula **@vlookup (C2,E2..F6,1)** in cell B2, and copy it to range B3..B12.

Now build a table, like the one shown on the next page, that associates the ranges of current values with the labels you want for them. To ensure 1-2-3 correctly sorts the labels it uses for row headings in the crosstab table, precede the label in cell F2 with two spaces and the label in cell F3 with one space, then right-align the labels in F2..F6.

Now, create your crosstab, using the column of lookup values as the column category. Select range A1..C12, then select *Tools•Database•Crosstab*. In the Crosstab Heading Options dialog box, select *Range* for the Row headings, se-

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	E	F
1	Bins	Labels
2	0	0 - 499
3	500	500 - 999
4	1000	1000 - 1499
5	1500	1500 - 1999
6	2000	2000 - 2499

lect *Branch* for the Column headings, and click *Continue*. In the Crosstab Data Options dialog box, 1-2-3 offers to sum the values in *Current*, which is what you want. When you click *Continue*, 1-2-3 creates a crosstab and places it in a new worksheet inserted after the current sheet. Now all you have to do is add a column of totals.

Using Excel to Find the Busiest Day of the Week

Q I work for a meat packing plant, where we log the date of stock shipments into an Excel 5.0 worksheet [see example at right].

	A	B
1	Date of Shipment	Number of Head
2	2/15/95	43
3	2/15/95	21
4	2/15/95	52

Now I need to prepare a report that shows the number of shipments by day of the week. In particular, I need to know which day of the week had the most shipments. What's the best way for me to handle this?

Elmer Pyron, Early, Iowa

A To find out which day of the week had the most shipments, try this formula, courtesy of Shane Devenshire of Walnut Creek, California.

If your dates are in range A2:A100, the array formula **{=choose(mode(weekday (A2:A100)),"Sun","Mon","Tue","Wed","Thu", "Fri","Sat")}** shows the name of the day that had the most shipments (be sure to press **<Ctrl>-<Shift>-<Enter>** to enter the formula as an array formula). In this formula—based on an old spreadsheet trick—the weekday function returns a code that corresponds to a day of the week; then the choose function uses that number to look up the day that occurs most frequently in A2:A100.

If you want the formula to accommodate gracefully as you add more shipments, substitute the term **offset(A2,0,0, count(A:A),1)** for the address A2:A100. This expression returns the range that contains date values in column A.

On the other hand, if you need a report that shows the number of shipments by day, enter **=choose(weekday(A2), "Sun","Mon","Tue","Wed","Thu","Fri","Sat")** in a new column, headed **dow**, in your list. Then create a copy for each shipment and use a pivot table to count the number of shipments by day of week.

Dynamic Graphs in Quattro Pro

Q I keep data on over 200 retail stores in a Quattro Pro 6.0 worksheet. I want to view the data in graphs, but I don't want to create 200 individual graphs. Can I create one graph that can switch from one store's data to another?

David Hagen, Columbus, Ohio

A To solve your problem, I combined an array lookup formula with a custom dialog box. To set up the model, follow these steps:

1. Enter the data in range A1..E9 and in cell G2 of **FIGURE 2**.

2. Assign the name **LocationTable** to range A1..E9, **LocationList** to range A2..A9, and **CurrentLocation** to cell G2.

3. Enter the formula **@array(B1..E1)** in cell H1, and then enter the formula **@array(@vlookup(currentlocation,$locationtable, {1,2,3,4}))** in cell H2.

4. Select range H1..K2, and use the Graph tool to create a bar chart. Select *Graphics • Titles*, and then enter **\CurrentLocation** as the Main Title.

5. Select *Tools • UI Builder*. Click the Combobox tool and draw the box. Next, right-click the box and choose *ComboBox Properties • List*. Enter the name **LocationList**, and click *OK*. Right-click again, choose *Connect*, and then enter the name **CurrentLocation** as the Target.

6. Click the *Button* tool and draw a button. Right-click the button and choose *Button Properties*. Click the *Execute Dialog* button, choose your dialog box from the list, specify **H4** as the Result Cell, and click *OK*. Click *Label Text* in the Button dialog box, and enter **Location**.

To change the graph, first click the *Location* button, then click the down arrow in the resulting dialog box, and lastly choose a city.

The heart of the model is the array formula in cell H2. It looks up the city name found in CurrentLocation (cell G2) in LocationTable (A1..E9) and yields the four values that appear in range H2..K2, one from each column of the database.

The custom dialog box lets you select a city from the list and drop it into CurrentLocation, where the lookup formula picks it up. The Result Cell (H4) shows a 1 or a 0, depending upon whether you clicked OK or Cancel. The Result Cell is superfluous in this example, but it is required.

By the way, notice the backslash character before the chart title in step 4. This character links the title to a named cell. It's a nice touch that lets your graph text change along with the text in the worksheet.

By Richard Scoville

Richard Scoville is a contributing editor for PC World *and a software training consultant based in Chapel Hill, North Carolina.* Spreadsheets *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

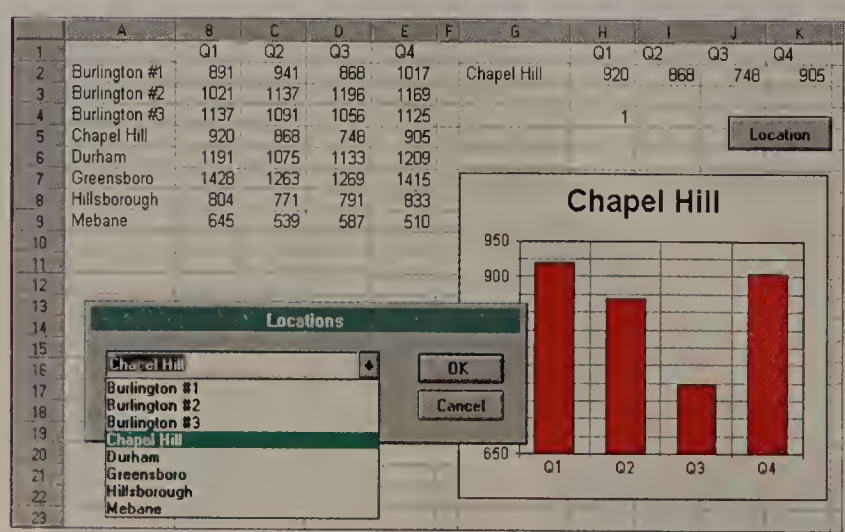

FIGURE 2: CREATE ONE DYNAMIC GRAPH FOR ALL YOUR DATA by combining an array formula with a lookup formula.

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WORD PROCESSING Q & A

Printing Selected Text in Windows Word Processors

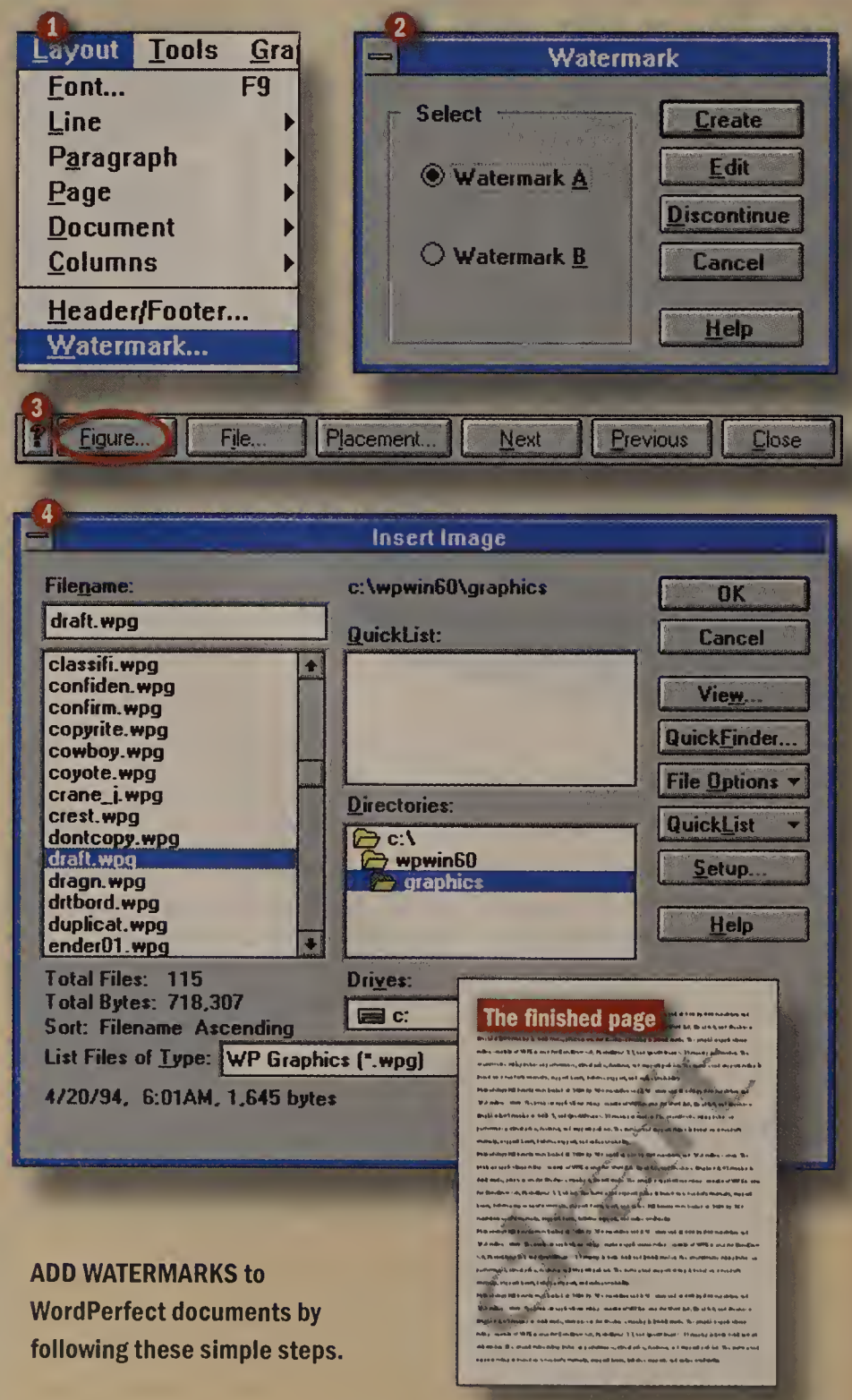
Q Occasionally I need to print only part of a document in Word 6.0a for Windows. I'd like to be able to print just the highlighted text. Can I do this?
Charles A. Emery, CompuServe

A You bet. Here's how to print highlighted text in the top three Windows word processors.

WinWord 6.0a: After highlighting the text, select *File•Print*. In the Print dialog box, click the *Selection* button in the Page Range frame, then click *OK*.

WordPerfect 6.x: With the text highlighted, select *File•Print*. The Selected Text option in the Print dialog box is already selected, so click *Print* to print the highlighted text.

Ami Pro 3.x: There's no direct way to handle this task in Ami Pro, but Lotus includes a macro called prnshade.smm to do the job. Highlight the text you want to print, select *Tools•Macros•Playback*, choose *prnshade.smm* from the Macros list, then click *OK*. If you can't find the macro, you'll have to run Ami Pro's installation program and install the included macros.



ADD WATERMARKS to WordPerfect documents by following these simple steps.

Text as Watermarks in WordPerfect 6.0a

Q Is there an add-on for WordPerfect 6.0a for Windows that will let me print "watermarks" on my documents? I'd like words such as *Draft*, *Confidential*, and *Don't Copy* to appear in a light shade of gray behind the text.
E. S. Marcarian, La Crescenta, California

A I have good news for you. You don't need to buy extra software to create watermarks in WordPerfect 6.0a. The facility is built right into the program and comes with a wide assortment of images suitable for use as watermarks.

To start, click in the first paragraph of the page on which you want a watermark. Then follow this step-by-step guide to insert those background words. For a visual guide, see the figure shown at left.

1. Select *Layout•Watermark* (in WordPerfect version 6.1, select *Format•Watermark*).
2. Select either *Watermark A* or *Watermark B*. (There's no difference between A and B; the program includes both to give you the option of using two different watermarks in a single document.) Select *Create*.
3. In the feature bar that appears, select *Figure* (*Image* in version 6.1).
4. In the Insert Image dialog box, change to the graphics directory under your main wpwin60 directory, and choose a .wpg file. To preview the image, click *View*. Click *OK* to insert the watermark. Click *Close* twice to get back to your document.

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exist, you can create it in the WP Draw program that comes with WordPerfect, then save it as a .wpg file. To access WP Draw, select *Graphics•Draw* from the WordPerfect main menu. See your manual or online help for instructions on using WP Draw.

Update on WordPerfect Online Support

Q In a previous column you said that Novell/WordPerfect doesn't offer its own support area on CompuServe. That's hard to believe. Are you sure?
Alan Goldman, Chicago

A At the time that column was written, Novell didn't have a dedicated, company-run support area for WordPerfect products on CompuServe. All support was provided by volunteer users in the WPUSERS forum.

Since then Novell has opened CompuServe forums to support WordPerfect for Windows and DOS. To reach these new forums, type either **go wpwin** (Windows) or **go wpdos** (DOS) at any CompuServe prompt. If you have WinCIM, select *Services•Go* and enter **wpwin** or **wpdos** in the Go dialog box.

Printing Existing WinWord 6.0 Documents

Q Is there any way to select WinWord 6.0 documents for printing without first loading them? I've been told this can't be done. Can you help?
Bob Baylor, Omaha

A Whoever told you that is wrong. WinWord offers a fairly easy way to handle this job on multiple files, but it's hard to find. Here's how to proceed:

Select *File•Find File*. You'll see either a list of files or the Search dialog box if you haven't done a file search before. If you see the Search dialog box, enter a file name (you can use wild cards) and a location (a directory or just a drive letter) in the Search For fields. Select the *Include Subdirectories* check box to search through all the subdirectories of the specified directory or across an entire drive, and click *OK*.

If you see a file list but haven't freshened it recently, click the *Search* button, then fill in the dialog box as described to add any newly created files to the list. When a list of files appears, select the ones you want to print by holding down **<Ctrl>** as you click the file names. Then click *Commands* and select *Print*. WinWord prints the files in the background while you continue with other work.

WinWord Graphics Don't Print

Q I'm having trouble printing graphics in WinWord 2.0. When I import graphics into my files, they show up on screen, but when I try to print them on my HP LaserJet II, I get a blank box where the graphics should go. I have no problems printing these graphics in other programs. What's wrong here?
Vera Godley, Durham, North Carolina

A The solution is simple, and with slight modifications it works in version 6.0 as well. At some point, you've set up WinWord for draft printing. In draft mode, the program prints the graphics as blank boxes. While this can be useful for quick printouts to check your layout, it doesn't do much good when you need to print a final version.

In version 2.0, select *Tools•Options*, then click the *Print* icon. Turn off the *Draft Output* option in the Printing Options frame, then click *OK*. In version 6.0, select *Tools•Options*, click the *Print* tab, deselect the *Draft Output* check box in the Printing Options frame, and click *OK*. WinWord will now print your graphics as you expect.

Page Borders in Ami Pro

Q I'd like to add page borders to some of my Ami Pro 3.1 documents. I'm sure there's a way, but I can't seem to find the trick. Can you tell me how?
Anita Wharton, Buffalo

A That's easy. Just select *Page•Modify Page Layout*, then click the *Lines* option button. Choose a line style from the Style list, then select *All*.

There's a trick to this, though: The default Inside setting in the Position frame puts the lines too close to your text, and the Outside setting puts the lines on the edge of the paper where they won't print at all. In most cases, the best position is *Close to Inside*. Select *View•Full Page* to see how the page will look. You may have to experiment to get just the effect you want.

Embedding Graphics in Ami Pro

Q I often insert graphics in my Ami Pro 3.1 documents from a collection of clip art on a CD-ROM. But when I later retrieve a document for editing, Ami Pro doesn't display the graphics unless that disc is in the drive. This is frustrating. Is there any way, other than copying the graphics file to my hard disk, to force Ami Pro to keep the graphics with the document?
Esther Maxwell, Philadelphia

A No problem, if you don't mind storing the entire graphic image in your document. By default, Ami Pro stores only a pointer to the graphics file when it saves a document. That saves disk space, but it also leads to the problem you're encountering.

When you choose *File•Import Picture*, select *Copy Image* before clicking *OK* in the Import Picture dialog box. Ami Pro will store the actual image in the document file itself and won't look for it on your CD-ROM drive.

The document file will be much larger than before, but it will load faster because Ami Pro won't have to convert the graphics to its own format. In addition, you'll be able to open the file on any PC with Ami Pro installed without having to take the graphics with you. I'd advise using this option only when you really need to, however, since documents with embedded graphics take up much more disk space.

By George Campbell

George Campbell is a contributing editor for PC World *and a contributor to* The PC Bible *(Peachpit Press, 1995, 800/283-9444).* Word Processing *welcomes your questions and pays $50 for published items.* *See page 12 for contact information.*

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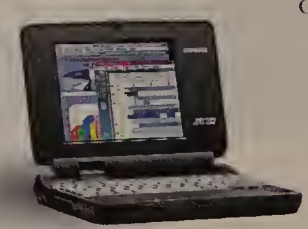

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WINDOWS Q&A

Where Do the Folders Go in Windows 95?

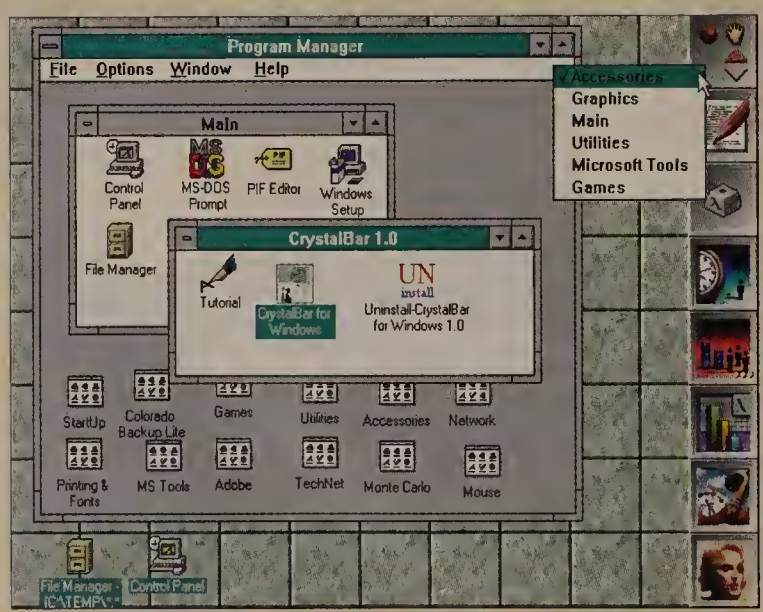
Q I've been creating and adding folders to my Windows 95 desktop to store my ongoing projects. While it's easy to open the documents and their originating Windows 3.*x* applications from the desktop just by double-clicking an icon, I'm having a hard time opening those same documents from within the application.

The trouble is, I don't seem to be able to find these documents on my hard disk. Where are they?

Kevin Stearn,
Albuquerque, New Mexico

A When you add folders and documents directly to the desktop, Windows 95 will store them in a special folder named, aptly enough, Desktop, within the folder where you installed Windows 95. The next time that you want to open a file, switch to that folder, and you will find your folders and documents. Once you switch to Windows 95 applications, you'll see that the common dialog boxes lessen the chance for confusion. Windows 95 lists the files and folders on your desktop when you select *Desktop* at the top of the Look In drop-down list.

Windows Toolbox: CrystalBar



CrystalBar 1.0 is one of the prettiest program launchers around. A vertical toolbar lets you launch or switch to your favorite program or file, and you can create multiple toolbars and switch among them using a pop-up menu. To spice up the buttons, choose from the utility's library of bit maps, or swap in your own. You can also customize button backgrounds and edges to look like metal, marble, wood paneling, cheese(!), or a design of your own. And you can create toolbars for all your Program Manager groups by dragging and dropping the appropriate .grp file from File Manager; you can add single buttons in the same way by dragging and dropping any .exe, .com, or .bat file. CrystalBar for Windows is available for $39.95 from MegaByte Int'l, 800/484-1318, ext. 4630. A demo version with a three-bar limit is available on PC World Online as crystal.zip.

Reader service no. 614

Comparing Directory Windows, the Sequel

Q In a previous column, you noted that File Manager won't let you view two floppy disk directory listings side by side if you have only one floppy drive. Not true! First, open two directory windows and tile them. Insert disk one in the drive and click the icon for the *A:* drive. Now remove disk one and put in disk two. Click the *A:* drive icon in the inactive window (this produces a copy of the directory for disk one), and finally press **<F5>** to refresh that window and display the contents of disk two.

Joseph G. Boyer,
Richmond, Virginia

A A number of readers suggested this simple way to view directory windows of two floppies simultaneously. The technique works great for the File Manager in Windows 3.1—which has a drive bar for each window—but the Windows for Workgroups File Manager insists that all directory windows display the same floppy when you press <F5> to refresh the listing. Consequently, users of Windows for Workgroups still need to choose *File•Search* on the A: drive to see different listings for different floppies. But users of Windows 3.1 should try the handy tip you suggest. Thanks!

Clean Slate in Windows 95

Q I like the way I can access the documents I work with regularly via the Documents menu in the taskbar, but I have a problem. The menu is easily cluttered with out-of-date documents, and I must struggle through the listing to get to the one I want. Is it possible to rearrange the listing in the Documents menu, say from alphabetical to chronological order?

Samantha Ryan,
Dorchester, Massachusetts

A No, unfortunately you can't change the order of the document listing in the Documents menu. Windows 95 lists the documents alphabetically, regardless of the order in which they were opened. There is a solution of sorts, though. When your Documents menu becomes a mishmash of old and new documents, you can remove the entire listing and start over, or you can choose to remove selected documents.

To remove the entire listing, right-click a blank area of the taskbar, and choose *Properties*. Click the *Start Menu Programs* tab, click the *Clear* button, then click *OK*. To remove specific documents from the listing, right-click the Start menu and choose *Explore*. Scan your Windows 95 folder and open the Recent folder, where shortcuts to the last 15 documents you worked with are displayed (see **FIGURE 1**). Delete those document names as you see fit.

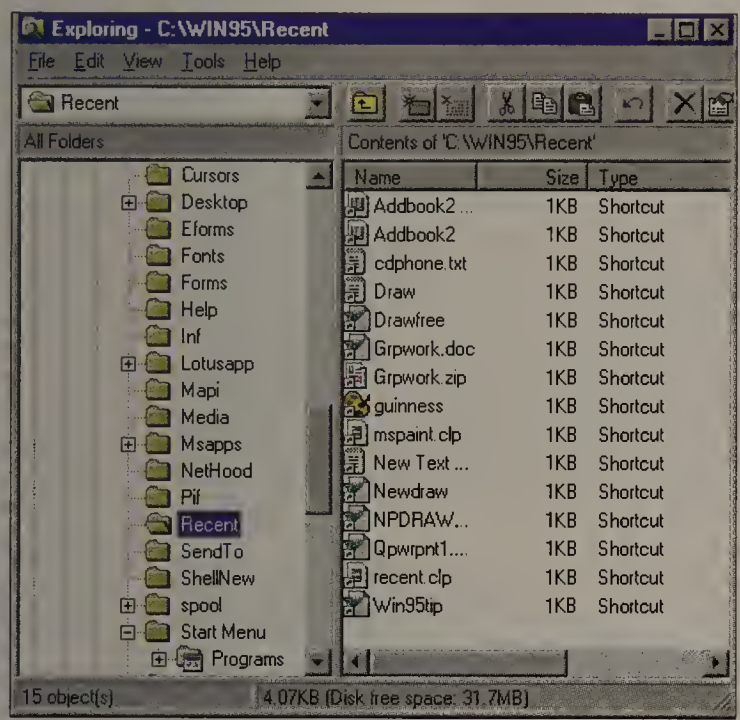


FIGURE 1: BLOW AWAY OLD FILE NAMES cluttering up your Documents menu: Go to the Recent folder in your Windows folder, select the document, and press <Delete>.

Clearing the Clutter in Windows 3.x

Q I want more space on the Windows desktop so I can cram in as much critical information as possible. Is there a way to suppress the descriptive labels for Windows icons?
Tom Lankard, CompuServe

A You can't turn off the labels, but you can render them virtually invisible. Less drastically, you can reduce the spacing between icons to give yourself more room. To adjust horizontal icon spacing, you can simply double-click the Desktop icon in Control Panel and look for the Icons portion of the dialog box. But since you must edit win.ini to control vertical spacing, it's easier to change both settings there.

In Program Manager, choose *File•Run*, type **win.ini**, and press **<Enter>**. Under the [Desktop] section, look for a line that begins 'IconSpacing='. The number at the end of this line is the horizontal spacing of your icons, in pixels. The default is 77, and the minimum is a very snug 32. Pick a number in between, and see if it works for you (restart Windows to see).

For vertical spacing, look for a line that begins 'IconVerticalSpacing='. If you do not see the line, just type it in under the [Desktop] heading. At the end, type the number **35**. This stratagem will make the vertical spacing so tight that when you minimize a running program on the desktop, the label will disappear below the bottom of the screen. If this solution is too extreme for your comfort, just type a larger number.

Save win.ini and restart Windows. If Auto Arrange is checked on Program Manager's Options menu, you should see the changes immediately. If not, select a group window and choose *Window•Arrange Icons*. If the spacing isn't to your liking, try other numbers. You can use Control Panel to adjust horizontal spacing only and see the results without restarting Windows (see **FIGURE 2**).

If you really want "blank" labels, select an icon in Program Manager, and press **<Alt>-<Enter>** to see the Program Item Properties. Press the **<Space>** bar to replace the Description box with a space, then press **<Enter>**. The icon appears to have no label unless you select it, in which case you see the space highlighted. Although you have to repeat this procedure for each icon in Program Manager, you can press these keys in rapid succession and then press the arrow key to move quickly through the icons in each group.

Does all this sound like too much trouble? If so, check out this month's *Windows Toolbox*. CrystalBar automatically creates compact icon toolbars from your existing program groups.

By Scott Dunn

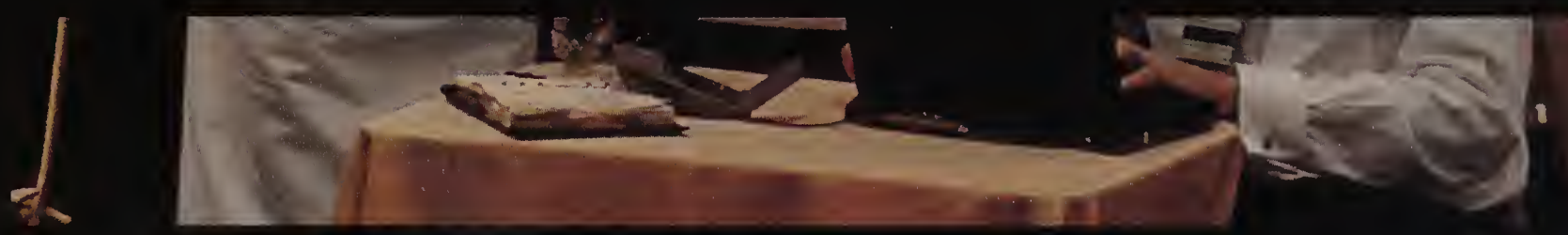
PC WORLD online *The files from this article are available via PC World Online on America Online and CompuServe. Scott Dunn is a contributing editor for* PC World *and coauthor of* 101 Windows Tips and Tricks *(Peachpit Press, 1992, 800/283-9444).* Windows *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

FIGURE 2: WIN.INI HOLDS ALL ICON SPACING DATA. You can change the horizontal setting through Control Panel, but you must edit win.ini directly to change the vertical spacing.

You're finishing a presentation

on Lotus Freelance Graphics,

printing a report on your boss' desk,



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WINDOWS 95 ADVISER

If you've used Windows 95 at all, you know that you access the Start menu quite often. So often, in fact, that it's worth taking the time to configure it intelligently. In this column, I'll present some of the best ways to get started with Start.

Unlike Windows 3.*x*'s lamentable Program Manager, which is based on oddities like program groups and program items (icons), the Start menu is based on a hierarchy of folders (a.k.a. directories). It's a hierarchy you can manipulate like any other, with everyday tools like Explorer or, if you insist, the command line. As a result, the Start menu is very flexible and powerful.

Furthermore, in that hierarchy of folders are shortcuts. Like program items, shortcuts are pointers you can double-click to jump elsewhere. Shortcuts, however, can point not just at programs but also at files, folders, network servers, printers—in short, just about anything. A discourse on shortcuts could fill a book; suffice it to say they're quite useful.

All those cascading menus that pop up off the Start button are just Windows 95's way of displaying a hierarchy of folders. The hierarchy begins at C:\Windows\Start Menu; to see it, right-click the *Start* button and select *Explore*. There are many ways to configure the Start menu—dragging shortcuts onto the Start button, accessing Taskbar•Properties from the Settings menu, or right-clicking an open spot on the taskbar and selecting Properties are just a few—but I find using Explorer the most direct.

Note that the Start menu—at the left of the screen in **FIGURE 1**—is divided by a line in its upper middle. The area above this line—customized here to contain Word and Excel, among other things—is the most valuable real estate on the menu because it's the first level and it's user configurable; the area below the line is not. As you can see in Explorer (on the right side of Figure 1), the menu items above the line correspond to shortcuts in C:\Windows\Start Menu, but Windows 95 doesn't put anything here by default. So your first step should be to move the shortcuts of applications you use every day to this folder. You'll find that six or seven is the practical maximum.

I'm a neatnik, so I've defined only one menu level of my own—Other Stuff—and it's full of shortcuts to programs I use rarely.

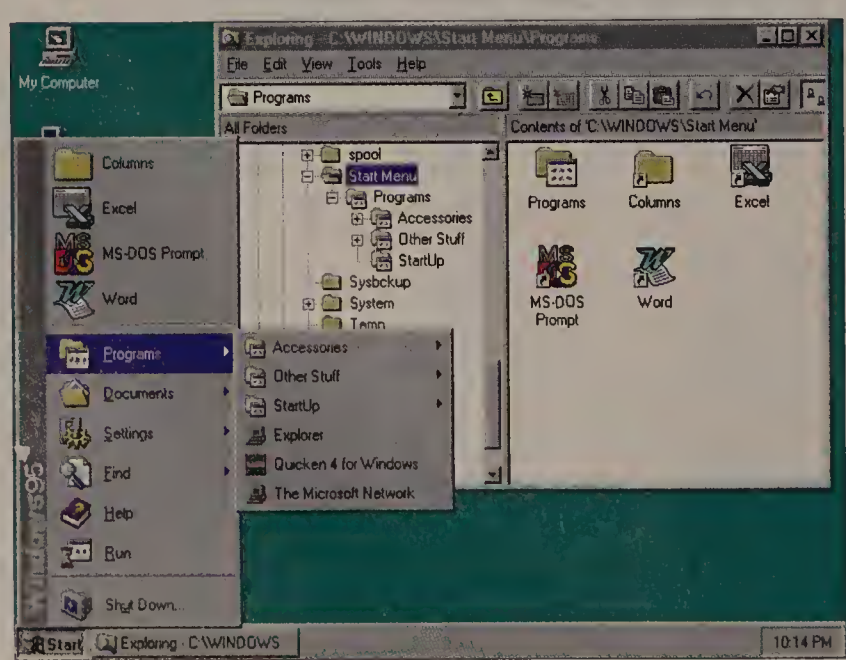

FIGURE 1: THE CUSTOMIZABLE AREA at the top of the Start menu is valuable real estate; stock it with shortcuts to your most commonly used apps plus a folder holding frequently accessed documents.

Besides programs, I also have a shortcut to a folder named Columns on this menu; it contains my most often used documents. To edit a document, I select Columns on the Start menu—which opens a window on the folder—and then double-click it. This is faster than running an application and then using File•Open; it's also faster than placing shortcuts on the desktop. The Start menu is one click away, while the desktop—inevitably covered by several maximized applications—is four clicks: a right-click on the taskbar followed by a left-click to Minimize All and two more to Undo Minimize All.

Next most valuable is the second-level menu that pops up when you select Programs on the top level; in Figure 1 it contains Explorer, Quicken, and The Microsoft Network. The items on this menu correspond to the shortcuts in the next folder down in the hierarchy, Windows\Start Menu\Programs, and I use it for programs I run often but not every day. In addition, I highly recommend creating shortcuts to more folders on the second and third levels because, properly configured, the Start menu provides the fastest way to manage documents.

On this second level, you can also create further levels of menus. A level is just a folder, and in Figure 1 the folders are Accessories, Other Stuff, and StartUp. StartUp is a special menu defined by Windows 95 that automatically launches applications when Windows loads; Accessories holds all the Windows 95 utilities. I'm a neatnik, so I've defined only one menu level of my own—Other Stuff—and it's full of shortcuts to programs I use rarely.

So gentlepeople, start your engines. The Start button is so useful that the time to rev it up is now.

By Richard Freedman

Richard Freedman, a former group manager on the Windows 95 team at Microsoft, is now a vice president at Garden Homes Management Corporation, a real estate investment firm in Stamford, Connecticut.

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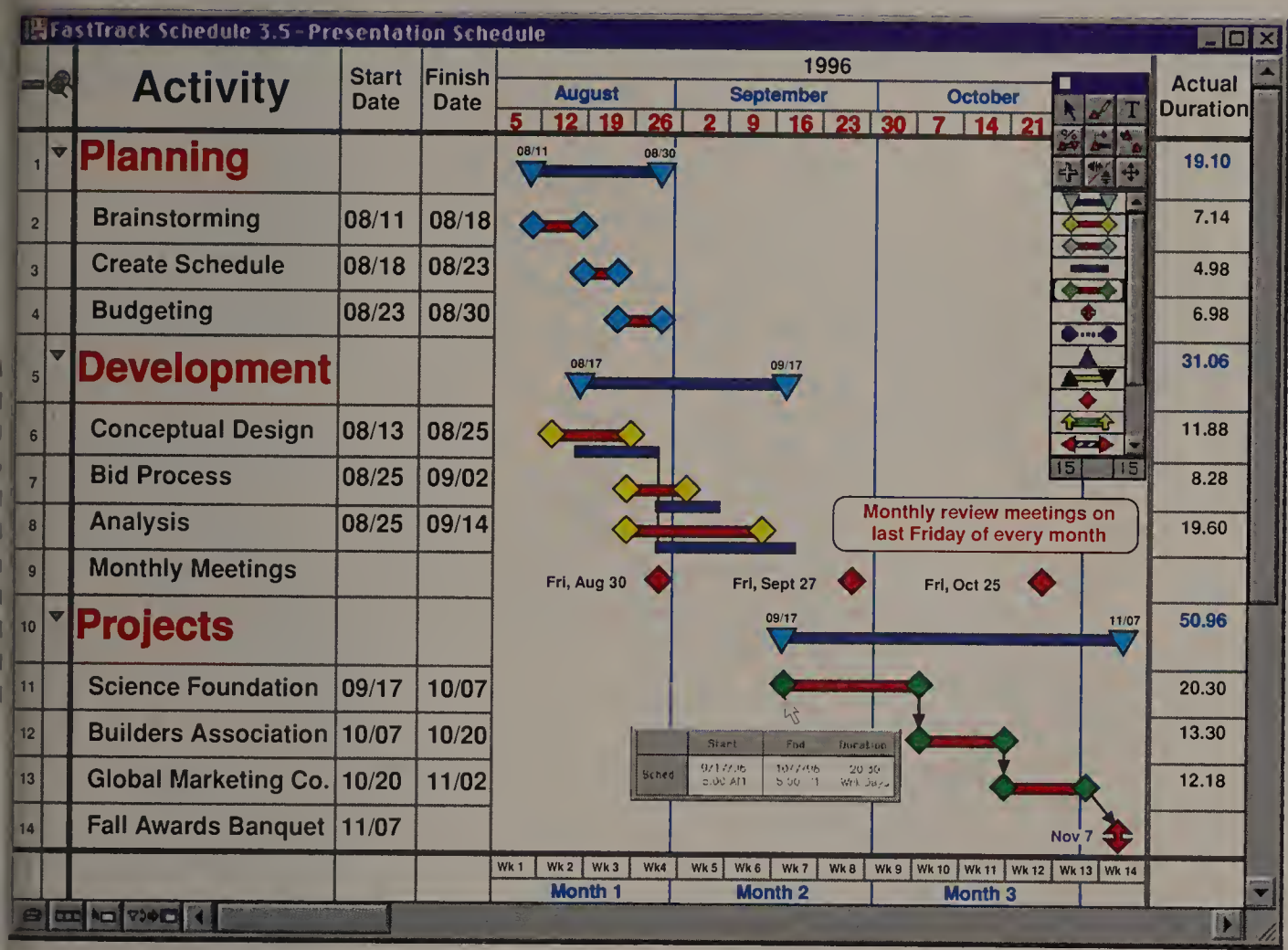

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DATA MANAGEMENT Q & A

Changing Paradox Tab Stops

Q I enter customer order information into a form created in Paradox 5.0 for Windows. When I enter a stock number, Paradox automatically fills in a description of the corresponding item. Can I set up the form so that Paradox will skip over the description field when I'm entering data?
Dahlia Stockwell,
Santa Monica, California

A Yes, you can change the next tab stop by changing the stock number field's properties. It's a quick process. Just follow these steps:

1. Open the form in design mode, and select the stock number field in your table. (You'll see handles around the field's frame.)

2. Click the right mouse button, select *Run Time•Next Tab Stop* from the Properties menu, and select the field you want to move to after entering a stock number. If you don't see this field on the list, click the ... item at the top of the list to open the Next Tab Stop dialog box. Scroll through the list until you find the field you want, then double-click it to return to your form.

3. Save the form. When you run it to enter data and press <Tab> or <Enter> in the stock number field, Paradox will skip the description field and land you in the next column.

Printing an Access Table Without Headers

Q How do I remove headers and footers when printing an Access table or query directly from the File menu? I know you can make this type of adjustment when printing forms or reports. I'd like to do the same thing without having to design a report first.
Michelle Jobst, Prior Lake, Minnesota

A You can't print a table without headers and footers, but you can design a report quickly with AutoReport, then eliminate the headers and footers with just a few keystrokes. Here's how:

1. Open the database and change the default AutoReport design to tabular: Choose *File•Add-ins•Add-in Manager* from the menu. In the Add-in Manager dialog box, click *Form* and *Report Wizards*, then click *Customize*. In the next dialog box, double-click *Customize AutoReport*. In the Layout section of the AutoReport Style dialog box, select *Tabular*. If your table is wider than 80 characters, select *Fit all the fields on one page*. Then click *OK* and *Close* to leave the Add-in Manager. (You can skip step 1 after you do this the first time.)

2. Open your table or query datasheet and click the *AutoReport* icon. Access will create a tabular report of your data. You may get some messages warning you that the report doesn't fit on one page; click *OK* to ignore them.

3. With the report window open, click the *Close Window* button to go into design mode. Choose *Format• Page Header/Footer* and click *OK* to remove the headers and footers.

4. When you're ready to print the report, press **<Ctrl>-P** to open the Print dialog box, then press **<Enter>**. When you close the report window, select *No* unless you want to save the report.

Updating a Pick List From an Access Form

In May's *Data Management* column, I showed how to open an Access 2.0 form of pick list values from another form using a macro attached to a button ("Opening One Form From Within Another in Access 2.0"). I noted that if you add a value to the pick list, it doesn't show up in the list until you reopen the form or switch from view mode to design mode and back again.

Chuck McKnett offered a better solution via America Online. By adding a short event procedure to the main form, he made Access refresh the pick list and show new or changed values as soon as the form is activated.

To try McKnett's solution, open your main form (the one with the pick list or combo box) in design mode. Right-click the white box under the form's control menu (where the rulers intersect), and select *Properties*. Click the white area after 'On Activate', click the ... button at the end of the line, and double-click *Code Builder* in the Choose Builder dialog box.

In the resulting window, enter the commands that tell Access to refresh the pick list when the form is activated:

```
Sub Form_Activate
Dim Cntl As Control
Set Cntl = Forms![Orders]![Field#]
Cntl.Requery
End Sub
```

The *Orders* term is the name of your order form, and *Field#* is the name of your combo box. (To find the name of the combo box that shows the pick list, open its Properties menu in design mode and check the entry after Name.) Close the Module window.

McKnett also showed how to open the form of pick list values with a new blank record, instead of the first record on the form. In design mode, right-click the button that opens the form of pick list values, choose *Properties*, and click the white space after 'On Click'. Click the ... button to open the Module window containing the commands that open the pick list form. After the line that reads 'DoCmd OpenForm DocName,,,LinkCriteria', add a line that says **DoCmd GoToRecord,,A_NEWREC**.

Close the window and the form, making sure to save your changes.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World *and the author of* The Paradox 5.0 for Windows Handbook *(Random House Electronic Publishing, 1994, 800/793-2665).* Data Management *welcomes your questions and pays $50 for published items.* *See page 12 for contact information.*

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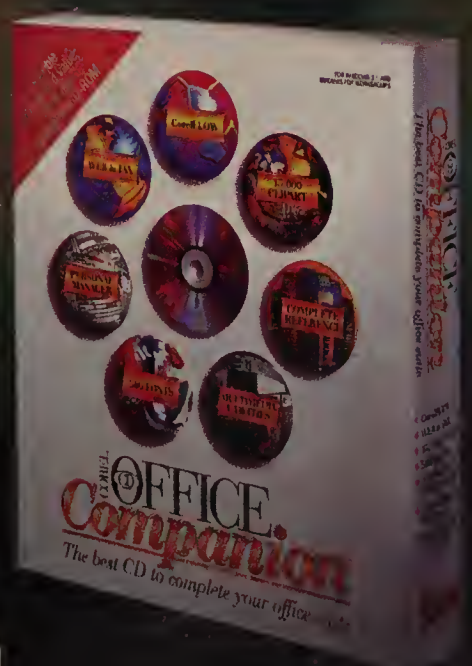

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PUBLISHING & PRESENTATIONS Q&A

Picture Bar Charts Made Easy

Q I want to produce bar charts in which predrawn objects such as telephones, automobiles, people, and food represent the bars. Can I do this in Microsoft PowerPoint, Freelance Graphics for Windows, or Harvard Graphics for Windows? Which is easiest for this type of chart?
Brian Leary, Apopka, Florida

A You can create picture charts in PowerPoint 4.0, Freelance Graphics 2.*x*, WordPerfect Presentations 3.0, and Adobe Persuasion 3.0, but only if you do it manually. Harvard Graphics, on the other hand, saves you time because it lets you create picture charts automatically by using its Bitmap Fill option.

To create a picture graph with each of these packages:

1. Create a regular bar chart with titles and data.

2. Get your pictures ready. In most cases, the easiest way to prepare an image for a picture graph is to first insert the clip art that you've selected into a blank page of your presentation (in slide view), and then edit it as necessary. For example, you may want to recolor it, rotate it, flip it, or scale it.

3. When you're ready to add the picture to the bar chart, copy it and paste as many duplicates as necessary to represent the amount of plotted data, such as a stack of coins. Or you can use a single picture, such as a stretched dollar bill, to represent each bar.

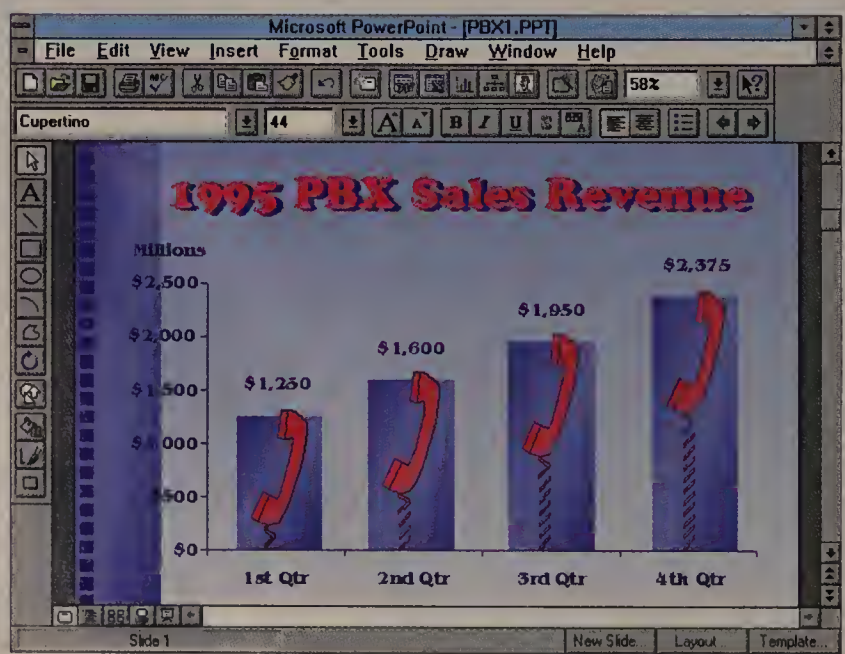
4. After you add the images to the picture chart, you can leave the original bars in the background or delete them.

Displaying the value that the bar represents at the top of each picture or stack of pictures is a good idea because it ensures that readers won't misinterpret the graph.

Harvard Graphics is the only application in this group that truly automates the process of creating a picture graph.

To make this happen, all you do is select the bars in the bar chart, then click on the *Fills* icon and hold down the mouse button to display a toolbar, and you'll see the Bitmap Fill icon on its right. In the Bitmap Fill dialog box, click the *Select bitmap* button and import the bit-map file (your choices being .bmp, .eps, .gif, .pcc, .pcd, .pcx, and .tif files) that you've picked to use in your picture chart.

There are four tile options for fitting the picture inside the bars, including scale (stretch or shrink), fill (original size), stacked vertical, and stacked horizontal. After you choose the tile option you want and click OK, Harvard automatically fills each bar with the image you designated.



TO CONVERT A BAR CHART INTO A PICTURE CHART in PowerPoint, Freelance Graphics, WordPerfect Presentations, and Adobe Persuasion, you manually paste a picture on top of each bar. Harvard Graphics' Bitmap Fill lets you create such charts automatically.

Create Multiple Backgrounds in PowerPoint

Q I'd like to use more than one template in a PowerPoint 4.0 presentation to make the first and last slides stand out like bookends. Is there any way to do this without creating two separate presentations?
Alexander Taub, Internet

A PowerPoint 4.0 doesn't allow you to use multiple templates in a single presentation (although PowerPoint for Windows 95 does). However, you can make the first and last slides stand out from the rest simply by changing their backgrounds.

Here's how to do it:

1. Open your PowerPoint presentation in Slides view and go to the first slide you want to change.

2. Select *Format•Slide Background* to open the Slide Background dialog box. Uncheck the *Display Objects on This Slide* box to remove any objects added by the slide master. Under the Color and Shading options, you can select different shade styles and variants and use the scroll bar to adjust the brightness (from dark to light).

3. Click the *Change Color* button to make the Background Color dialog box appear. Pick a new color from the

USER GROUP TIP

Layer Components in CorelDraw

When creating maps in CorelDraw 5.0, you'll find it easier to make global changes to, say, the font size and styles of boundaries or roads if you add each component as a layer. When you work this way, the fonts, colors, or styles on one layer can be changed at once without affecting the other layers.

Wilde Legard
PC Clubhouse

How Do You Tell If It's A "Trinitron"?

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Color Palette, or click *More Colors* to access more sophisticated color controls, such as hue, saturation, and luminance.

When finished, click *OK* to return to the Slide Background dialog box, and click *Apply* to implement your changes and return to the slide.

That's it. Go to the end of your presentation and repeat these steps to change the background for the final slide.

Just remember that for a professional-looking presentation, you should choose complementary colors for text, objects, and background, and be consistent.

From WP Presentations to PowerPoint

Q Is there any way to import slide-show files from WordPerfect Presentations 3.0 into Microsoft PowerPoint 4.0? I prefer using WP Presentations, but I need to distribute my shows in PowerPoint format.
Ed Buckley, Linwood, New Jersey

A Unfortunately, PowerPoint can't directly import presentation files from WP Presentations the way it can from Freelance Graphics and Harvard Graphics. And I don't know of any utility that does this conversion either.

However, there is an indirect way around the problem: Save each WordPerfect Presentations slide in your show as an individual graphics file, and then use PowerPoint to import each one of these files as individual slides.

Here's the drill:

1. Open your presentation file in WP Presentations, and go to List or Outliner view (both let you select slides by number or title). Next, select the first slide you want to export, and press **<F3>** to open the Save As dialog box.

In the box, change the Format option to *WordPerfect Graphics (WPG)*, give the slide a file name with the extension **wpg**, and then click *Save*.

Repeat the same procedure for each slide that you want to export.

2. In PowerPoint, open a new presentation (select *File•New•Blank Presentation*). In the Choose an Autolayout section of the New Slide dialog box, select the blank template. Make sure that you're in Slides view (*View•Slide*), and then select *Insert•Picture*.

In the dialog box, find and select the .wpg file you want to use as the first slide and click *OK*, and PowerPoint then will add it to the slide presentation.

3. For each additional .wpg file, click *New Slide* (at the bottom of the screen), choose the blank template, and use the Insert Picture dialog box in the same manner to add the file.

To edit one of these .wpg files after importing it into PowerPoint, double-click it and then click *OK* at the 'Convert the picture to PowerPoint objects?' prompt. You can then edit the text freely and change other objects in the slide.

By Richard Jantz

Contributing Editor Richard Jantz is an electronic publishing and presentations consultant in Berkeley, California. Publishing & Presentations *welcomes your questions.* PC World *pays $50 for published questions.* *See page 12 for contact information.* ■

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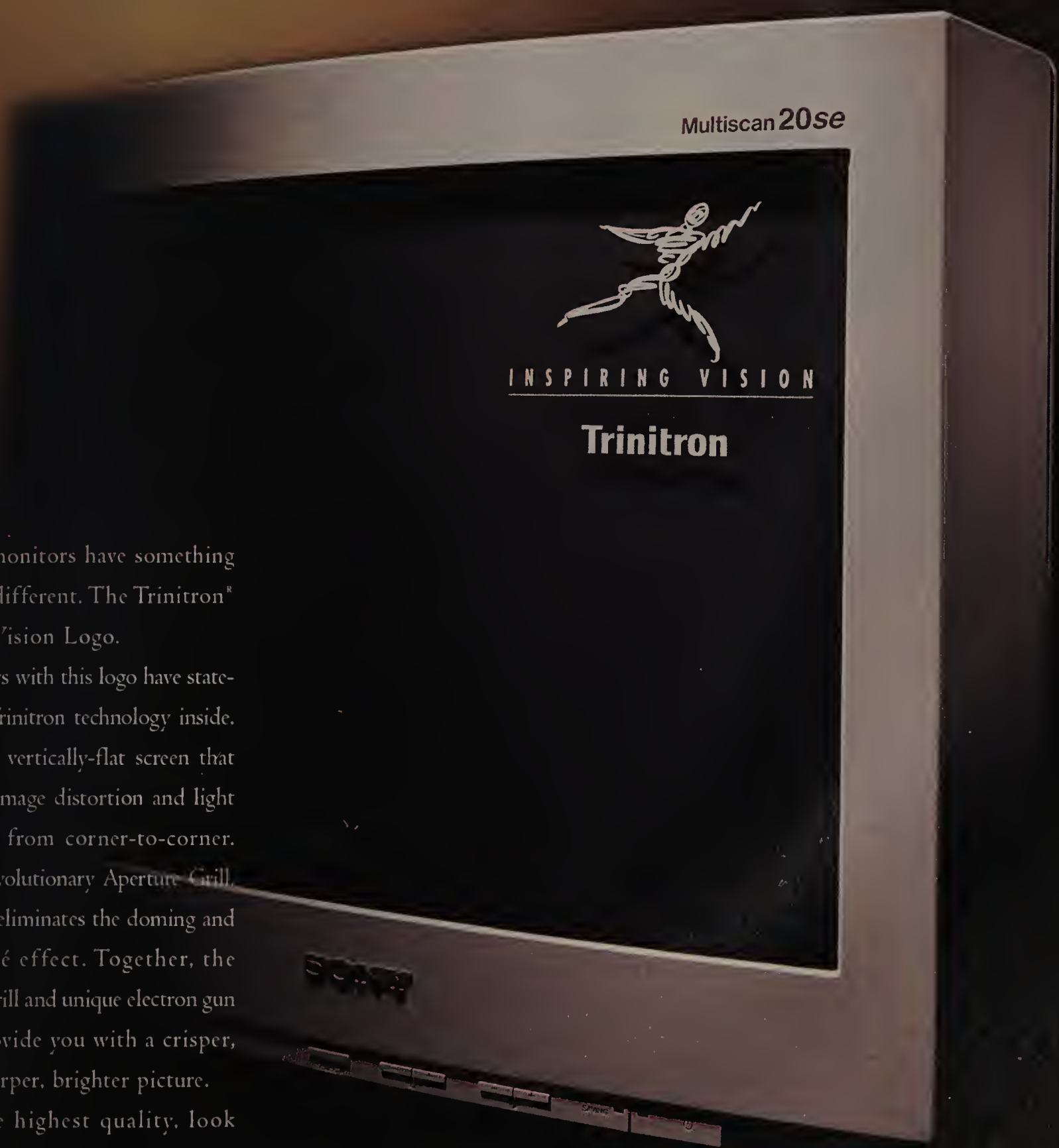

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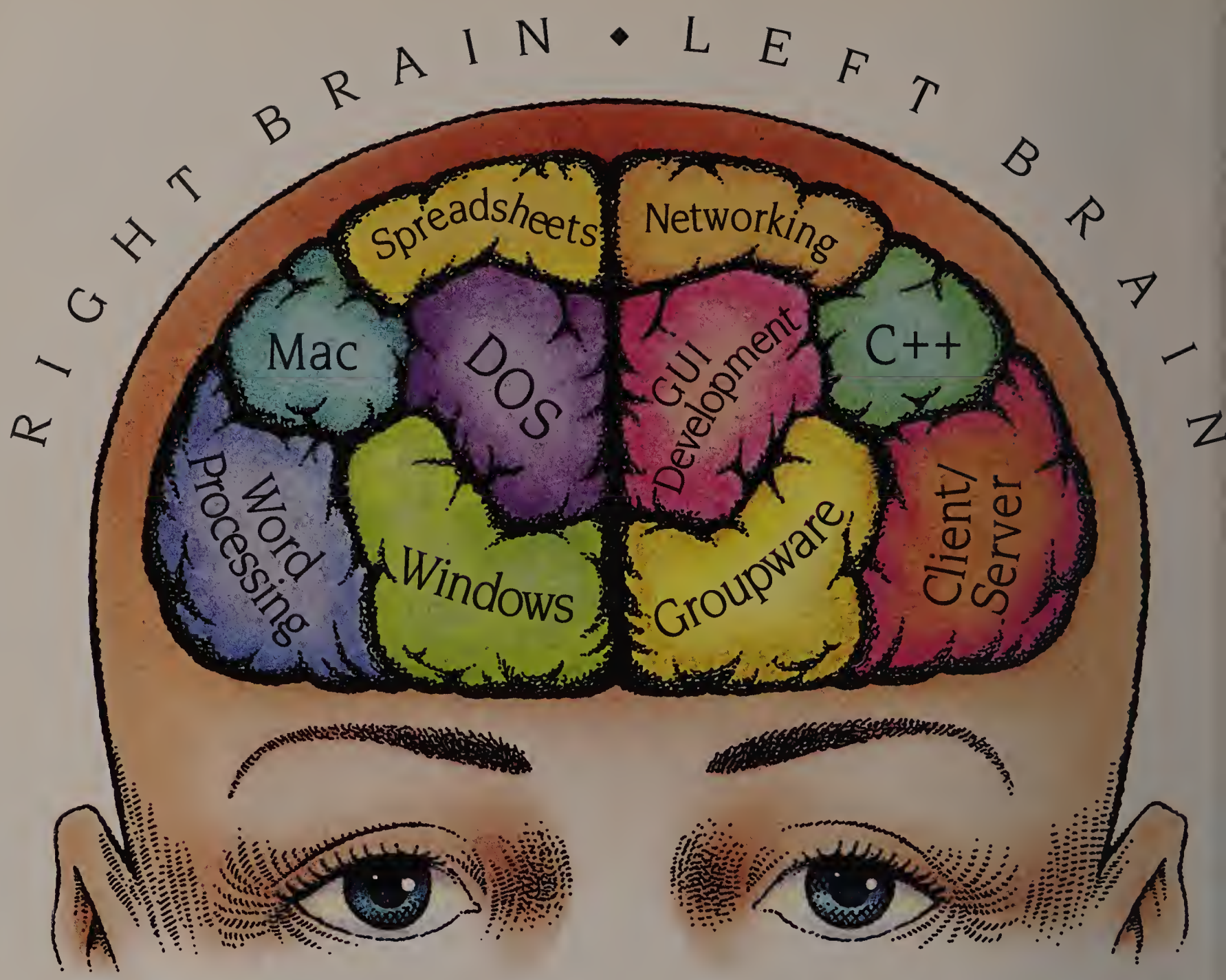

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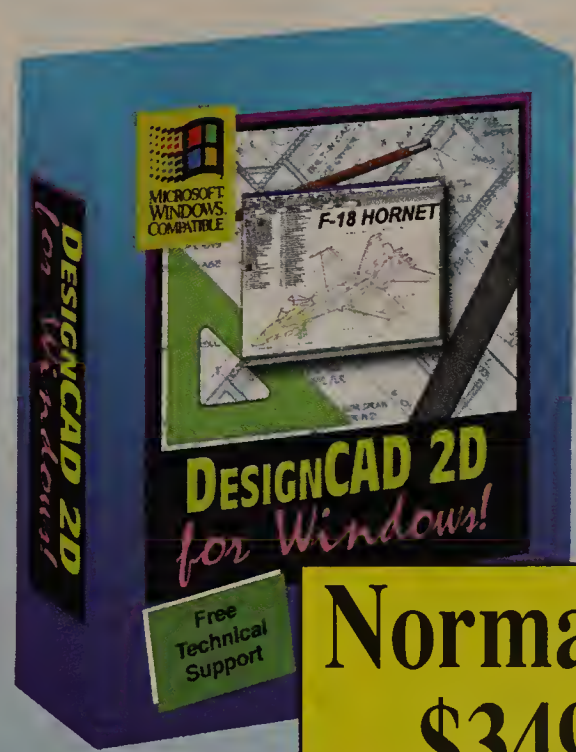

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Q I've been hearing about computer services that let you follow the stock market, buy and sell stocks, get account updates, and keep an online stock portfolio—all from your PC. A friend of mine is really into it, and I want to try it, too. Can you tell me more about this type of service?
David R. Perez,
Garden Grove, California

A CompuServe, America Online, and Prodigy all offer end-of-day closing stock prices and let you track your stocks in a portfolio as part of their monthly fee. The services also offer research, ranging from bar charts on an issue's performance to rankings of mutual funds and company financials. Some of this data is cheap—for example, *Money* magazine's mutual fund database on CompuServe is free—but accessing these databases may incur extra hourly charges or monthly fees.

All the services also offer online access to one or more brokerages where you can place orders. These range from Charles Schwab, a discount brokerage on GEnie, to E-Trade Securities, a deep-discount brokerage on CompuServe. Max Ule, who runs a discount brokerage on CompuServe, claims that most of his online clients eventually gravitate to a traditional broker-client relationship in which they call him by phone for advice and to place orders.

Many large brokerages, such as Fidelity Investments, Olde Discount Stockbrokers, and Charles Schwab, offer their own online services. Customers use special software to place orders, receive information on their accounts, and download stock quotes. If you're a heavy trader, these services are a good deal—but they offer few advantages for the occasional trader. The same is true of brokerages available through online services: While trading online may be cheaper than trading over the phone, online services may be more expensive than traditional deep-discount brokers.

You won't find brokerages on the Internet; security is far too lax for stock orders. But you can find stock quotes, bar charts, and other data to help you in your investment decisions. A good place to start your search is on MIT's Experimental Stock Market Data Web page, **http://www.ai.mit.edu/stocks** (see **FIGURE 1**). It offers performance charts for hundreds of stocks and mutual funds, plus links to other Net sites with investment information.

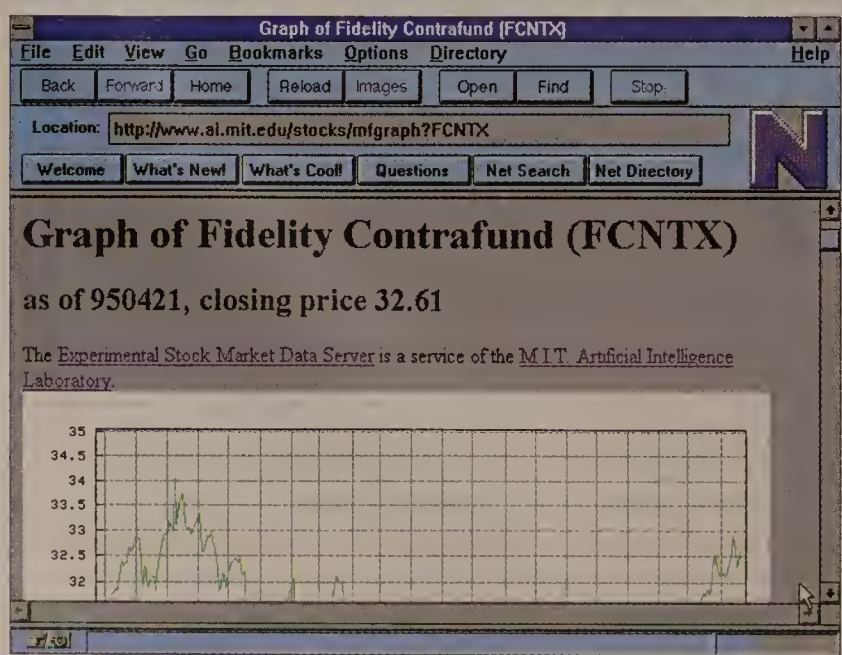

FIGURE 1: CHECK YOUR FIDELITY ACCOUNT on MIT's Experimental Stock Market Data page, http://www.ai.mit.edu/stocks.

If you're an international trader, head to the Financial Information Link Library, **http://www.mbnet.mb.ca:80/~russell/**, where you'll find hot links to foreign stock markets and investment information.

Finally, a word of caution: Never invest in anything you haven't thoroughly researched. Cyberspace is a breeding ground for financial scams and con artists posing as brokers. One self-proclaimed cybercop I know likes to say, "Remember that every prison in the country now has a computer lab."

Those Blasted Web Error Messages!

Q I tried connecting to all the World Wide Web pages you recommended in "Where to Start Your Web Surfing" (*Online*, May), but all I got were 'Failed DNS Lookup' error messages. What's a DNS?
John Riddle, Internet

A Web surfing is a blast, but sometimes you get wiped out by error messages. The two most common errors are lookup failures and timeouts. The first means that your Internet service couldn't find the Web page you were trying to access. The second means that the page may exist, but the computer where it sits took too long to answer and your browser gave up. DNS stands for *domain name system*, which is the Internet system that assigns E-mail addresses to computers. 'Failed DNS Lookup' means that your Internet server couldn't find the computer where the Web page resided.

There are so many links in the Web chain—your Internet service, the remote computers that you're trying to contact, and all the computers in between—that troubleshooting is hard. I regularly access the Web through a half-dozen Internet accounts, and I find that the only way to explain some errors is to blame them on sunspots. I get 'Failed DNS Lookup' errors when I try to connect to my own Web page!

I have the most problems surfing the Web through commercial online services like CompuServe and Prodigy. Their Web browsers work, but they're prone to lockups and general testiness. And of course they're slow.

Here are some strategies for coping with Web woes:

• Store as bookmarks the addresses of reliable Web pages. When I start a

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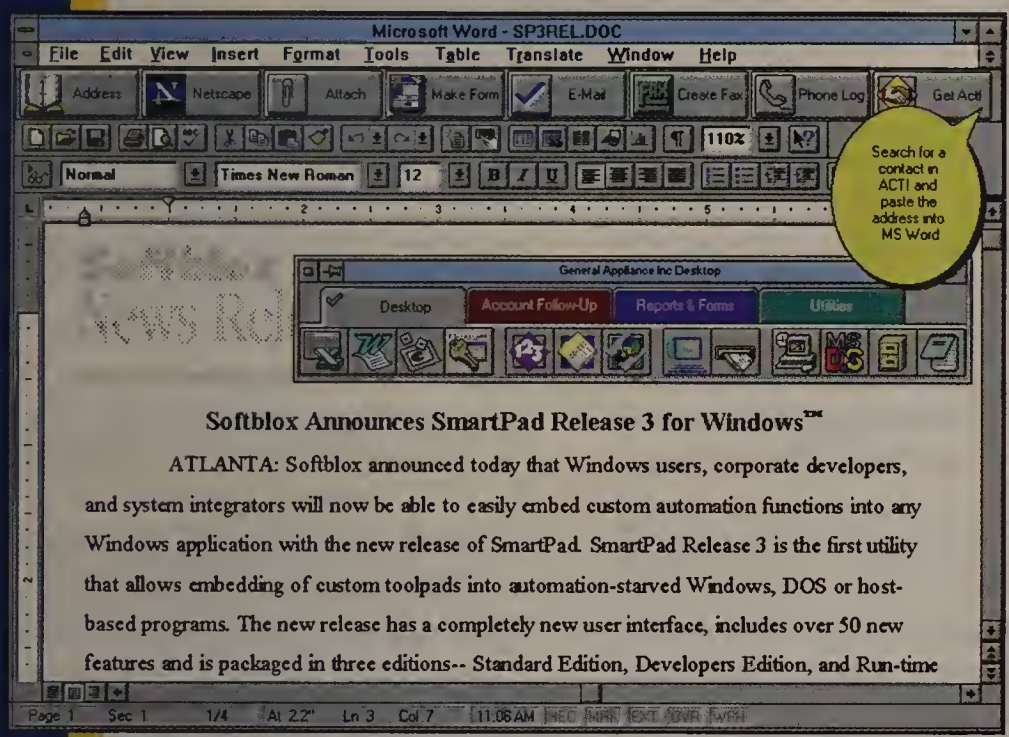

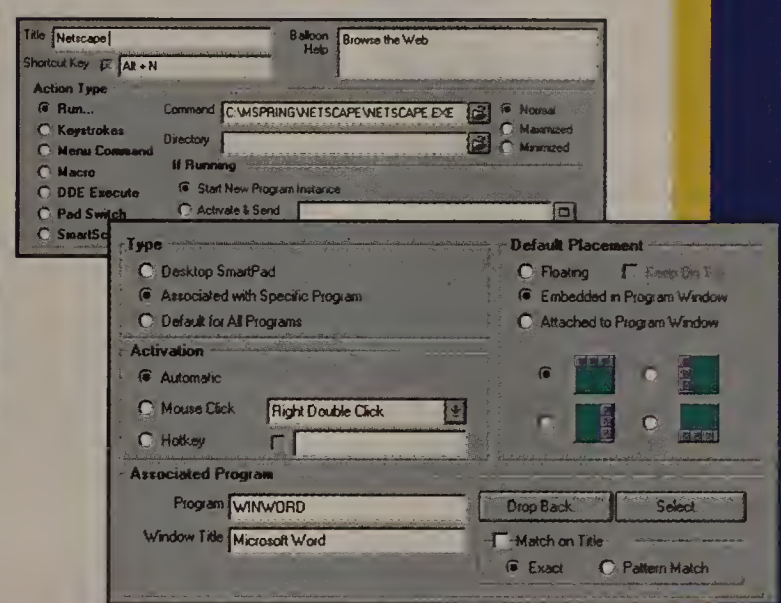

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Web session, I head to one of those pages first to see if my Internet service is working. If I later have trouble accessing multiple Web pages, I head back to one of those pages to make sure my link is still working.

• If you get a lookup or timeout error while trying to access a Web page, try it again the next day. It often works fine on the second try.

• Avoid peak times like evenings and weekends. I can never get on the Web on Saturday nights anymore. Maybe it's because my Internet service providers are flooded with callers, or the Web itself is slowing down because so many people are getting online. If you suspect that this may be the problem, try calling back early in the morning or on a weekday.

• If you get repeated lookup errors trying to access a page, work back through its address. For instance, if the address is http://www.mit.ai.edu/stocks.html/finance.html, type just the first part—**http://www.mit.ai.edu**. Sometimes that will take you to the host's main menu. If that doesn't work, add the next part—**http://www.mit.ai.edu/stocks.html/**. (Think of the address as a subdirectory on your hard disk: You access the root first, then proceed to the next level, and so on.)

By Judy Heim

Judy Heim is a contributing editor for PC World *and author of* I Lost My Baby, My Pickup and My Guitar on the Information Highway *(No Starch Press, 1995, 800/420-7240).* Online *welcomes your questions and pays $50 for published items.* *See page 12 for contact information.* ■

Internet Glossary

SLIP and PPP: *Serial Line Internet Protocol* and *Point-to-Point Protocol*. Your Internet service provider should offer one or the other. Both protocols give you access to the World Wide Web and let you use graphical Internet tools like Chameleon. SLIP and PPP access the Internet differently from dial-up and shell accounts; they don't require your PC to use traditional terminal emulation and communications software.

SLIP is the older protocol, while PPP is supposedly more reliable and faster. Some people say you should shop for a PPP link and avoid a SLIP one, but I use both regularly and don't find any difference. If you're an average consumer—rather than a business that plans to connect an entire office to the Internet—buy whichever one is cheaper.

If you want to connect to the Internet through SLIP or PPP, you also need to install a program called a *TCP/IP stack*.

TCP/IP: *Transmission Control Protocol/Internet Protocol*. A set of protocols that standardizes the transmission of data over the Internet. TCP/IP stack programs like Trumpet Winsock and Chameleon's Custom talk to the Internet "behind the scenes" while you run Internet tools such as the Mosaic Web browser or the Eudora mail reader.

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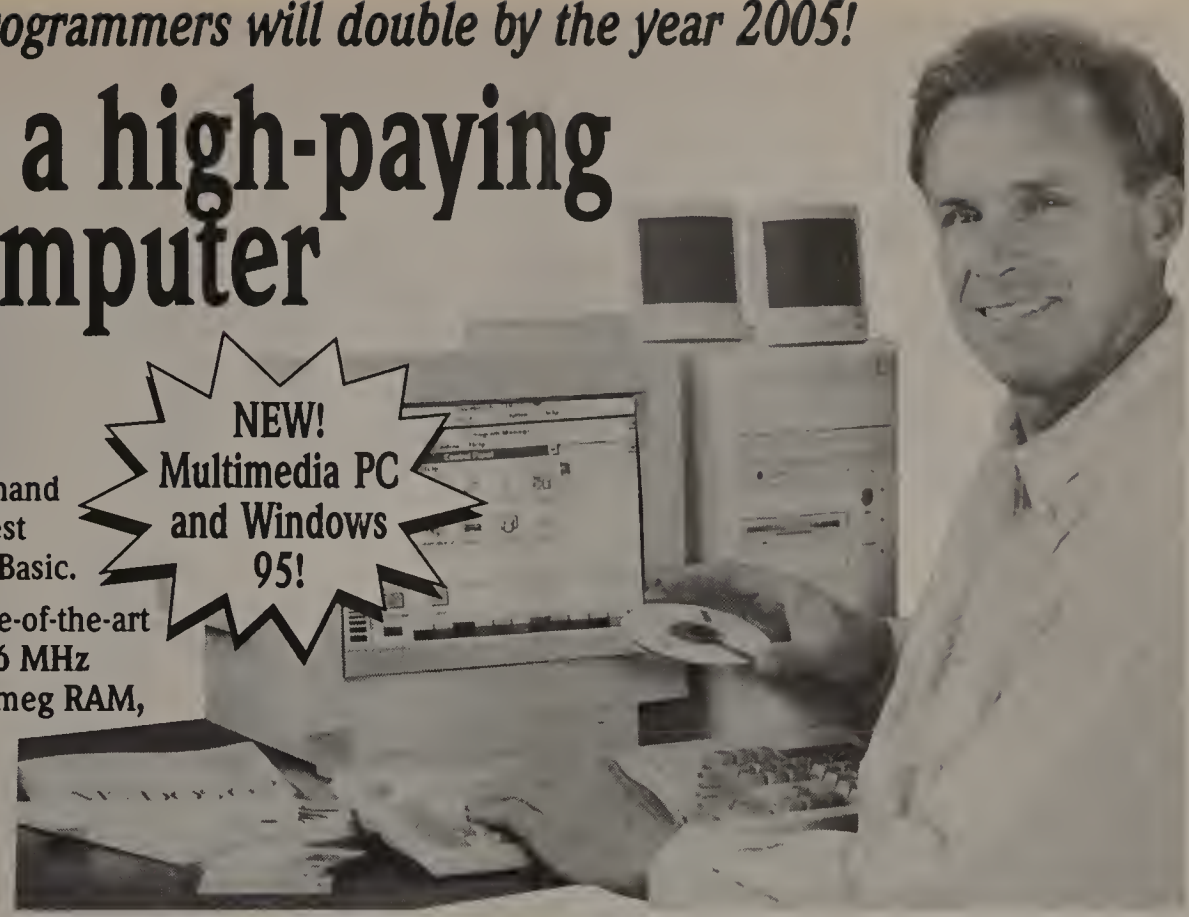

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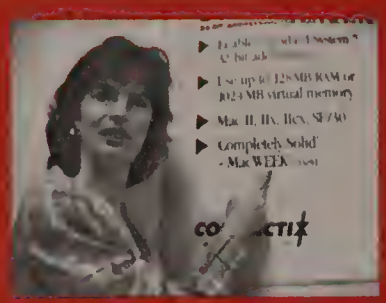

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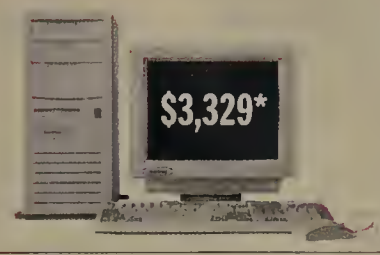

Processor	486DX 2/66	Pentium 90MHz	Pentium 133MHz
Processor Upgradable	Yes	Yes	Yes
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Hard Drive	630MB	1GB	1GB
Cache Internal	8KB	16KB	16KB
Cache External	256KB (optional)	256KB	256KB
Local Bus Graphics	PCI	PCI	PCI
Video Memory/Max.	1MB/2MB	1MB/2MB	1MB/2MB
Compaq 150 Color Monitor	Yes	Yes	Yes
Diskette Drive	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB
Expansion Slots (Total)	3	4	5
Drive Bays (Total)	3	4	5
Ports: Serial/Parallel	1/1 (ECP)	1/1 (ECP)	1/1 (ECP)
Security Features	Yes	Yes	Yes
101-Key Keyboard, Mouse	Yes	Yes	Yes
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HARDWARE Q&A

Windows 95 Stumbles on PCI

Q I just upgraded to Windows 95 and I'm plugging and playing, configuring my hardware so everything works. I'm surprised at how smooth the process has been, with one exception: When I installed my PCI graphics card, Windows 95's Device Manager (the configuration utility) told me there was an irreconcilable conflict. The card seems to work, but something's not right. What's the problem?
Yolanda Washington, Richmond, Virginia

A You just opened up a can of worms. Plug and Play works great with most ISA and VL bus cards: Plug and Play devices are configured automatically, while non–Plug and Play devices are usually identified correctly by Windows 95 so the operating system can work around them. But configuring PCI graphics cards can get complicated, and the fault lies with PCI itself.

From the start, PCI was supposed to be "plug and play" in the generic sense, letting you install devices without manually setting IRQs, I/O addresses, and so on. But early versions of the PCI specification were a bit loose, and some PCI boards wouldn't work in some machines. Ever since version 2.0 of the PCI spec emerged a year and a half ago, PCI has worked pretty well—but not well enough for Windows 95 to fully configure all PCI devices.

The problem is that Windows 95 cannot automatically reassign PCI IRQs. (Every PC has 16 of these interrupt request lines, special CPU hotlines that most boards require in order to function.) In most systems, PCI buses enable all PCI boards to share a single IRQ. Windows 95 can detect which IRQ is in use by the PCI bus, but it can't change it. So if a non–Plug and Play card wants the PCI bus IRQ, you must move a jumper on that card so it will want a different IRQ.

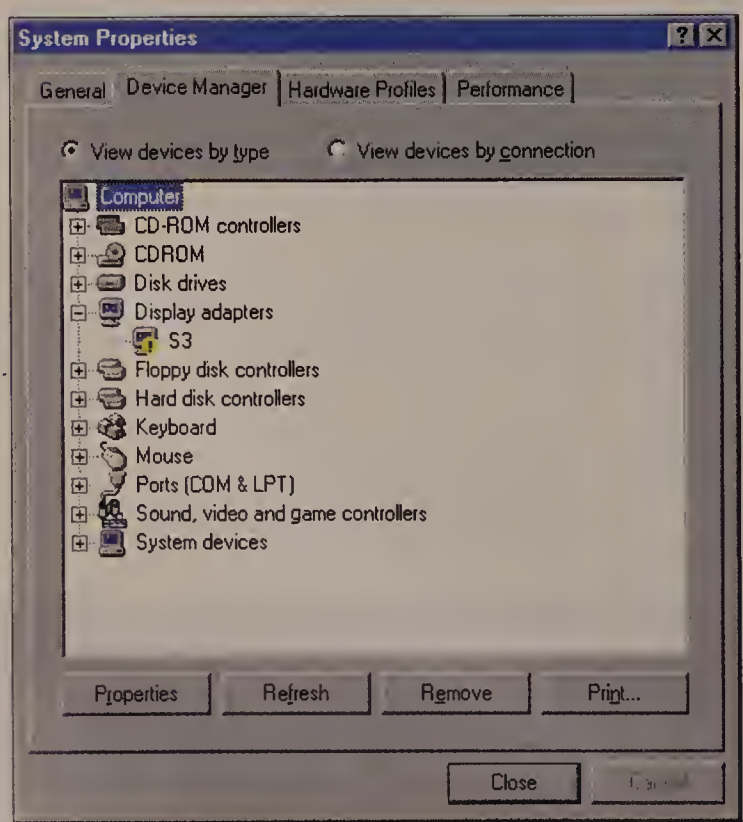
Now for your error message. According to Microsoft, in the vast majority of cases the problem you describe derives from an IRQ conflict between the PCI bus and your system's secondary IDE interface, which compete for IRQ 15. Your system works anyway because your PCI graphics card doesn't use an IRQ. Most people use the PCI bus for graphics cards only, which is why some PCI system vendors let the conflict slide.

Since it works, who cares? You should, because the conflict puts a drag on performance. Windows 95 normally installs protected-mode drivers for the IDE interface and the graphics card. When there's a conflict, it defaults to real-mode drivers, which are considerably slower. And when either the vendor or Windows 95 fails to provide a protected-mode driver for *any* PCI device, real-mode drivers are installed for *every* device that shares the IRQ on a PCI bus.

If you tried to install a PCI device that used an IRQ—say, a SCSI interface—it probably wouldn't work at all unless you ran its old-fashioned installation routine to load its real-mode driver manually. Worse, if there's a conflict or a real-mode driver in use for one device, and another device on the bus *lacks* a real-mode driver—likely only with new Plug and Play devices—then the latter device is disabled.

Here's the fix: If your BIOS permits, use your system setup utility to manually give your PCI bus an interrupt other than IRQ 15 (IRQs 10, 11, and 12 are likely choices). If your BIOS won't allow this, check with your system vendor to see if the company has a BIOS revision that will; if you have a flash BIOS, you can usually download the revision from the manufacturer's BBS. If no BIOS fix is available, try disabling the secondary IDE interface by using the setup utility or by moving a jumper. If your system won't let you do this either, then you're stuck with the real-mode drivers.

Version 2.1 of the PCI spec promises to let Windows 95 reassign PCI IRQs automatically and to enable PCI cards to identify themselves properly. If you buy a PC in the next few months, look for a model with a PCI 2.1 bus.



WINDOWS 95'S DEVICE MANAGER is a comprehensive tool for configuring and troubleshooting hardware. But if your system has a PCI bus, Device Manager may flag spurious conflicts like this one under Display Adapters.

Fast EDO RAM

Q I recently read a PC advertisement that promoted EDO memory as a special feature. What kind of memory is EDO RAM? Will EDO SIMMs make my PC run faster?
Fitra Alim, Bandung, Indonesia

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Circle 140 on reader service card

get this benefit, both your SIMMs and your system must support it. You can't upgrade your system to support EDO RAM, but if you're buying a new PC, look for a model that supports this hot feature.

Here's how EDO works: Although CPUs usually find what they need in a fast memory cache, they resort to slower main memory from 4 to 20 percent of the time—incurring *wait states*, clock cycles in which the CPU spins its wheels. To minimize wait states, all systems use *fast page mode*, which allows an entire row (or page) of main memory to stay open for fast access. But fast page mode's cycle times aren't short enough—and the page of data isn't on the processor bus for a long enough time—to avoid incurring multiple wait states in a system with a fast CPU. EDO's innovation is to shorten memory cycle times and lengthen the time that data stays on the processor bus, reducing the number of wait states in accessing main memory.

At this writing, EDO SIMMs cost about $5 more per megabyte than standard SIMMs. If your system supports EDO RAM, you can usually mix EDO SIMMs with ordinary SIMMs and still add speed.

Laser Versus LED

Q I'm in the market for a laser-quality printer. I've noticed a number of LED-based printers mentioned in the same breath as actual lasers. Could you explain the difference? Which is better?
Chris Ball, Fort Worth, Texas

A Laser printers use a scanning laser beam to "etch" a facsimile of the page onto a rotating electrostatic drum; toner clings to the "etched" portions, and is then transferred and fixed to the page using heat of around 400 degrees. With light-emitting diode printers, the process is identical, except that a row of fixed LEDs replaces the laser. To print pages with a horizontal resolution of 300 dots per inch, an LED printer needs 2550 tiny lights that can flash on and off consistently millions of times.

I've seen little difference between LED printers and lasers in 300-dpi print quality and in reliability. Okidata's budget-price model OL400e came very close to winning a Best Buy in last February's laser printer roundup. However, the Okidata 600e—a very similar design—produced the worst 600-dpi output I've seen, probably because the drum could not rotate precisely enough to keep the rows of dots lined up.

Kyocera appears to have conquered the problem, introducing four LED printers in the pas few months, including a $1599 600-dpi workgroup model dubbed the FS-1600A. Always compare printouts under a magnifying glass before you decide—even printers of the same make and model can produce different results.

- **FS-1600A** $1599; Kyocera Electronics, Inc.; 800/232-6797
  Reader service no. 760

By Eric Knorr

Eric Knorr is a contributing editor for PC World *and editor and principal author of* The PC Bible *(Peachpit Press, 1995, 800/283-9444).* Hardware *welcomes your questions and pays $50 for published items.* *See page 12 for contact information.* ■

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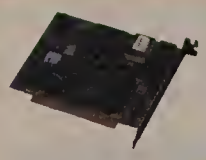

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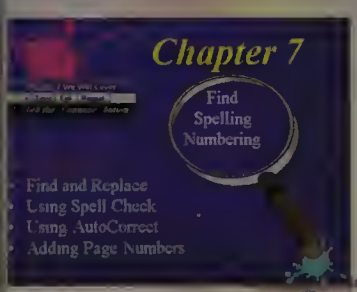

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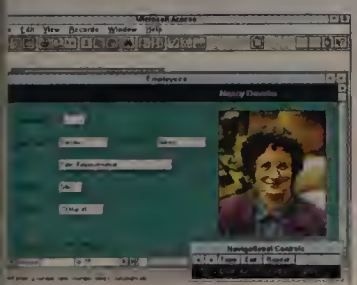

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STAR-DOT-STAR TIPS

No Waiting for Word

If you're low on disk space, Word for Windows' Fast Save feature can cause you huge headaches. Why? Fast Save adds changes to the end of a document without deleting old text, thus sacrificing disk space for faster performance. That's why I prefer to use fast saves in the middle of editing, then do a normal save when I close the file—something Microsoft doesn't make automatic.

I've written two simple macros [see **FIGURE 1**] that address this shortcoming. The first macro turns on Fast Save when a document is merely saved; the second turns Fast Save back off when you close the document.

James A. Jones, Jr., Haysi, Virginia

Editor's note: By naming these macros FileSave and FileClose, you can make their use automatic, so any standard menu selections, toolbar icons, or hot keys for saving or closing files will run them. The On Error statements prevent the macros from halting with an error message if you cancel a save or close operation.

To create the first macro, select *Tools•Macro* and enter the macro name **FileSave**. When you click *Create*, WinWord makes a skeleton macro for the command. Edit the skeleton macro until it looks exactly like the first macro shown in Figure 1, then close it and save your changes. Follow the same steps to create the second macro, only name it **FileClose**.

By the way, FileSave and FileClose don't alter the way automatic saves are done in WinWord. Automatic saves, performed at fixed intervals on all the files you've changed in WinWord, are always fast saves. And since you can't do fast saves across a network, they will have no effect if you're editing a file on a server's hard disk.

I believe in the (slightly modified) adage "Save early and often."

```
Sub MAIN
ToolsOptionsSave .FastSaves = 1
On Error Resume Next
FileSave
End Sub

Sub MAIN
ToolsOptionsSave .FastSaves = 0
On Error Resume Next
FileClose 1
On Error Goto 0
ToolsOptionsSave .FastSaves = 1
End Sub
```

FIGURE 1: STREAMLINE WINWORD SAVES with these two simple macros. The first optimizes saves for speed rather than size when they occur in the middle of an editing session. The second ensures that Word for Windows stores files efficiently.

Choose the Capable Cable

After connecting our two printers—a Canon BJC-600 and a Canon BJC-4000—to two different computers, we had trouble printing from Windows. We could print from DOS applications like WordPerfect, but in Windows we received a message saying the printer was turned off or not online.

We discovered that the problem was caused by an inadequate printer cable. The PC's BIOS doesn't use all the signals on the printer port, but Windows does. Therefore, a cable without all the correct wires may work fine in DOS but prevent you from printing in Windows. When we changed the cable, the printer worked correctly.

Lance Jarrett,
High Point, North Carolina

Editor's note: Windows' printing functions bypass your PC's BIOS and go directly to the hardware, so incompatibilities can arise. If you don't have another printer cable handy, you can sometimes circumvent this problem by opening Control Panel, double-clicking the *Printers* icon, clicking the *Connect* button, and choosing the printer port *LPT1.DOS*. (In Windows 3.0, select *LPT1.OS2*.) This forces Windows to use DOS and the BIOS instead of bypassing them. But if you want the best performance, or plan to move to a 32-bit operating system such as OS/2, it's best to replace the cable and make the printer connection fully functional.

Also, if you have a bidirectional parallel port and a printer that supports a bidirectional parallel interface, make sure your cable supports these as well.

The Output's in the Mail

Have you ever needed to E-mail fancy documents that contain special fonts or figures, and faxing just wouldn't do? Simply make your application print to a file instead of to your printer, then attach the resulting file to an E-mail message. In the text portion of your message, tell the recipient to save your file to disk, then print it with the command **copy /b** *filename.prn* **prn**, where *filename.prn* is the name of your file. (The /b parameter ensures that binary codes in the file are transferred to the printer without any filtering.) The result comes out on the recipient's printer as if you had printed it yourself.

Paul Kimmel, Okemos, Michigan

Editor's note: This trick is ideal when you don't want to use fax, mail, express services, or messengers to send formatted information, and the recipient lacks the program you used to create the document. The one limitation is that you must "print" using a driver the recipient's printer can understand. If he or she has a laser printer, the HP LaserJet Series II driver is a good bet.

To prepare to print a file within Windows, launch Control Panel, double-click the *Printers* icon, click *Add*, and add the appropriate printer (you may be prompted for your original Windows floppy). Once the printer appears in your list, click the *Connect* button, and for Ports select *FILE*. When you print to your new "printer," Windows will ask you to name the file.

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Bureau of Missing Operating Systems

If you boot your machine and get the message 'Operating system missing', don't panic! While this message sometimes signals a malfunctioning or corrupted hard disk, it often crops up when the contents of your machine's CMOS RAM have been destroyed. Before you do anything else, try restoring your machine's CMOS settings.

Patrick Cernyar, New Lenox, Illinois

Editor's note: A CMOS RAM is a battery-backed memory store for your computer's time, date, and system information. A corrupted CMOS can prevent your system from reading the bootstrap information from the hard drive, leading it to conclude that the operating system is missing.

As Cernyar suggests, the first thing to do is to check your CMOS settings—in particular, the ones that govern the hard drive. Use your BIOS's automatic sensing facility to find the correct disk settings, or (if the BIOS doesn't have this feature) program them as directed in the disk's instruction manual or on the drive label. Only if this doesn't work should you check the cables—or worry that your drive might be malfunctioning or infected by a virus.

Peace and Quiet at Last

The two usual methods of suppressing output from batch files—issuing the command @echo off and redirecting program output to nul—don't always work. If a program shows an error message by sending output to the screen, for example, it will appear even if you use both of the above techniques.

A better solution: Place the command @ctty nul at the beginning of the batch file and @ctty con at the end. These commands suppress output so well that even echo statements don't echo—assuring you of no output when the batch file runs.

Craig Tomchuk, Halifax, Nova Scotia, Canada

Editor's note: The ctty command, originally used to allow a terminal attached to a serial port to become the system console, is an effective way to suppress output from DOS. As a bonus, it suppresses keyboard input. DOS won't accept keystrokes from the keyboard between the @ctty nul and @ctty con commands. (Note that the @ signs in these commands keep the commands themselves from being echoed.) This makes the ctty command a useful security measure; it prevents users from halting a batch file once it has started.

It's important to note, however, that programs that bypass DOS and write directly to the screen—or that poll the keyboard directly via the BIOS—*will* display output and accept input even when @ctty nul is in effect. Also, be warned that if your batch file terminates midway for any reason (or invokes another batch file and never returns), the @ctty con command, which restores control to the keyboard, might not be executed, leaving you unable to enter DOS commands.

Catching Files in the Web

Most people know how to use their World Wide Web browsers to access Web pages—HTML documents designed for viewing on the Web. But not everyone knows that you can also use a browser to retrieve files from an Internet site that's not on the Web. Instead of an address that begins with http, you specify an address with the prefix ftp, which stands for File Transfer Protocol.

To do this, tell your Web browser to "go to" the Uniform Resource Locator (URL) **ftp://***hostname*; it will show you a top-level directory listing. You can then browse the directory tree, picking and retrieving the files you want. There's no need to log in as "anonymous" or enter your E-mail address as with other FTP programs; the browser handles it all automatically so you can get on with the business of downloading files.

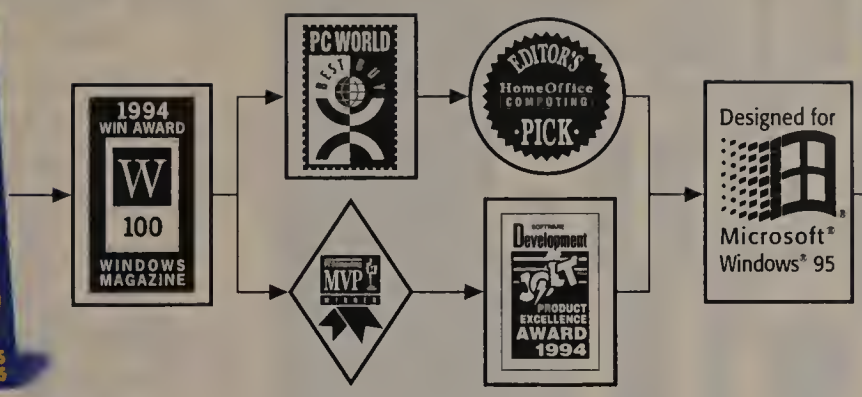
Mark Hendam, Denver

POWER TIP no. 322

DOS in Windows in the Right Place

If you're in the Windows File Manager and you want to run a DOS session in your current directory, don't go to Program Manager's MS-DOS Prompt. Instead, select File • Run, and at the resulting prompt, type command and press <Enter>.

Lincoln Spector
Senior Associate Editor



Last year, Visio 3.0 won praise from the experts.

Smart new Visio 4.0 is designed to win praise from you.

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Given the great reception we received last year, we knew Visio 3.0 would be a tough act to follow. So we set out to make our newest version smarter and more efficient than even the experts could imagine.

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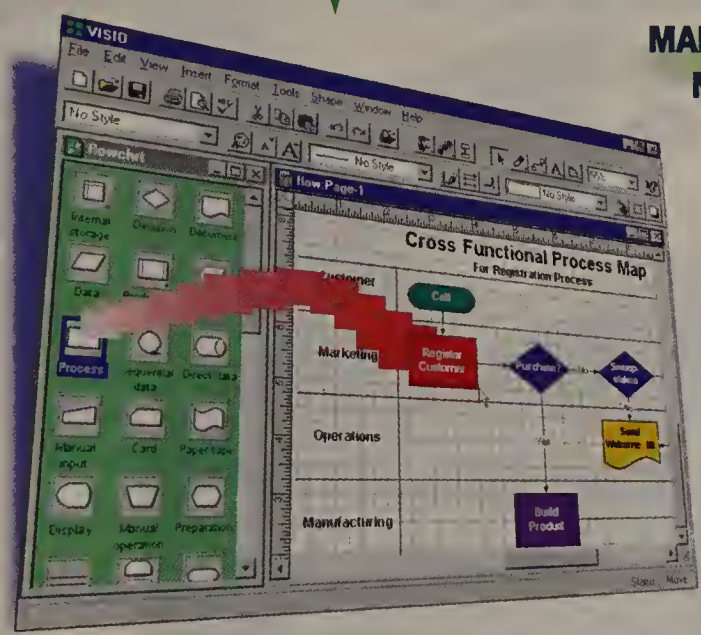
You'll find Visio 4.0 is the only program you'll need to create flowcharts, block diagrams, marketing charts, office layouts—you name it.

It even has a Flowchart Converter, making it a snap to convert your ABC flowcharts and CorelFLOW drawings into smart Visio diagrams. Plus, it's designed to fully exploit both Windows 3.1 and Windows 95—all in one box.



Visio 4.0 comes with over 1,000 pre-drawn SmartShapes on 29 task-specific stencils. To create diagrams, just drag SmartShapes onto the drawing page, connect, add text and voilà. You're done.

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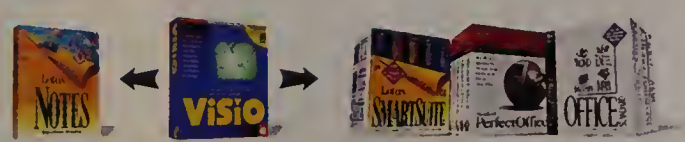
Visio 4.0's new Custom Properties feature allows you to add data behind your shapes. So, for example, in process flows you can see how efficient process paths are at a glance. And, because Visio works with the programs you work in, you can export the data to Excel for further analyzing. **Visio 4.0 also comes with a 60-day money-back guarantee. So you have nothing to lose. To order Visio 4.0 for just $149—or upgrade for $79—contact your local reseller or call 800-24-VISIO ext. F29 today. Since you get Visio for both Windows 3.1 and Windows 95, it's the smartest move you can make.**



Visio supports the new Microsoft Office Binder, offers a user interface option for each of the three suites, and supports Lotus Notes/FX. It's no wonder corporations are standardizing on it.

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Editor's note: This trick works because each generation of Internet tools is compatible with the ones that came before. Web browsers can browse resources available via Gopher, a distributed system of menus that was the predecessor of the Web. (Like the Web, Gopher lets you jump instantly from machine to machine in search of information, but it doesn't have the Web's hypertext or graphics capabilities.) Gopher, in turn, has always supported easy access to libraries of files available via FTP and to hosts that are accessible via Telnet (that is, ones that interact with users as if they were at a terminal connected directly to that host). A complete Web browser supports all four types of access.

The code before the colon at the URL's beginning (for example, http, gopher, or ftp) tells the browser which access method to use. The Web is slow, so if all you want is to download files, go right to FTP—even if the host has Web capabilities.

Solving a Sticky Problem

Ever wish floppy disk labels weren't so difficult to remove? Here's a solution: Stick a label onto your clothing, peel it off, and *then* put it on your floppy. When you want to change it, it will peel off without tearing.
L. Fuller, America Online

By Brett Glass

Brett Glass is a contributing editor for PC World. PC World *welcomes your tips and questions and pays $50 for published items. If you have a general computer question, send it to* Help Line. *See page 12 for contact information.*

POWER TIP no. 323

Fast Formats

Need a floppy formatted fast? In DOS, you can pop a used disk in your drive and use the command format a: /q /u for an instant format. The catch is that you won't be able to unformat the floppy if you discover you need some of the old files.

Suzy Lewis
Internet

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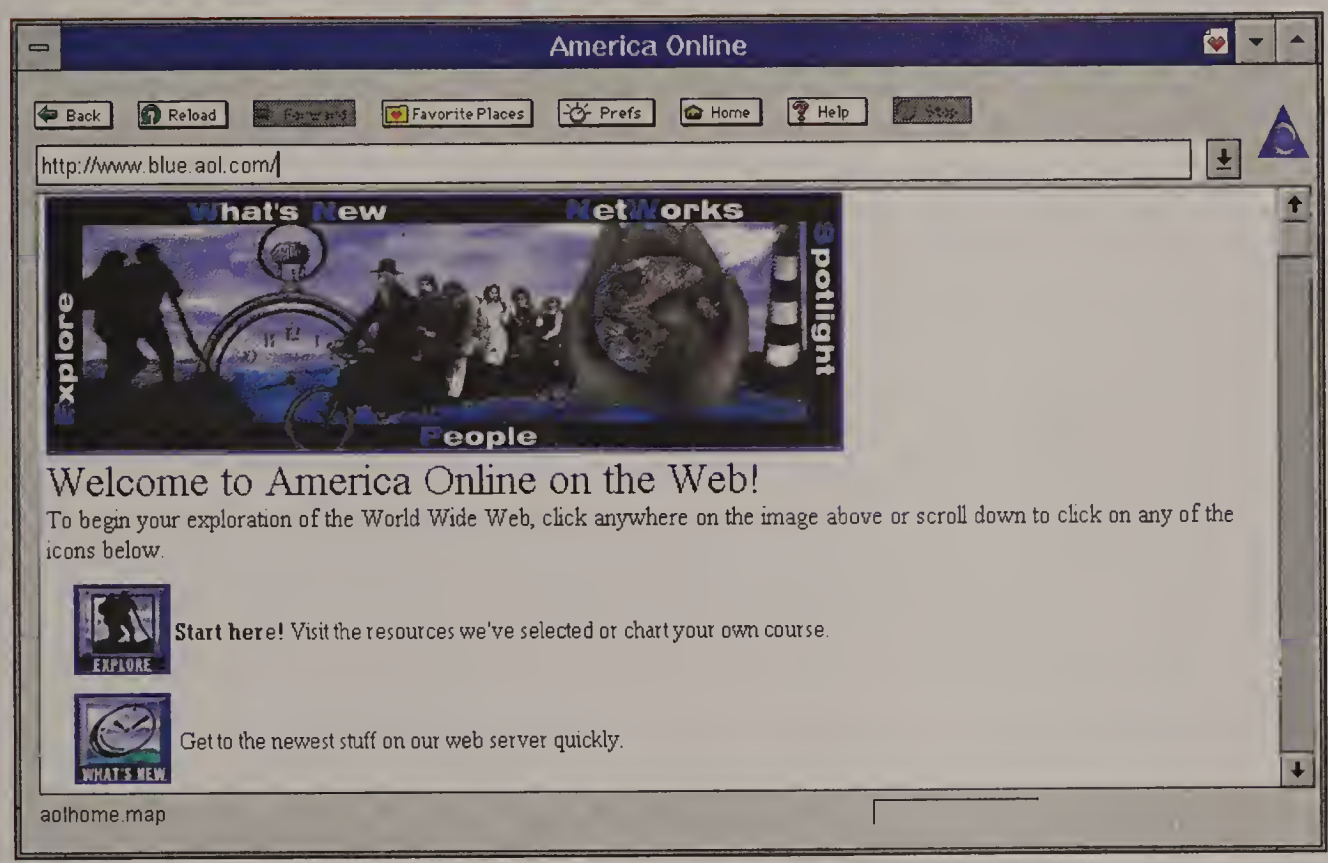
Lincoln Millstein, The Boston Globe, June 15, 1995



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* To use America Online for Windows, you must have a 386 PC or higher, 4MB of RAM, a VGA monitor (256 color support recommended), a mouse, a modem, and a working copy of Windows 3.1. Features for America Online's Macintosh software may differ. America Online's Web Browser is not available in a DOS format.

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P1095B

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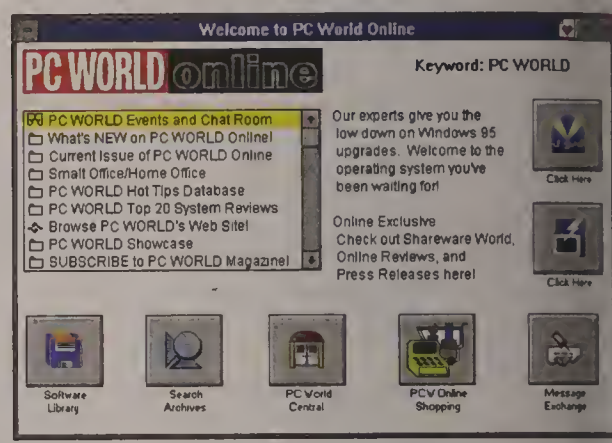

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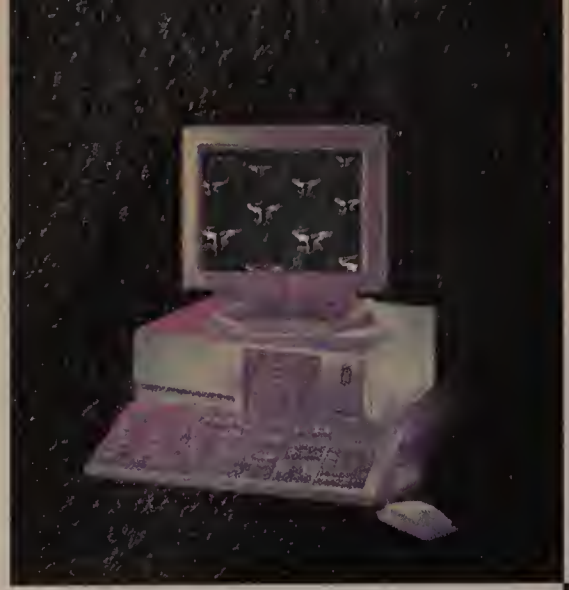

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MICROSOFT WINDOWS 95 Part 2

In Windows 95, you browse and manage your computer and network resources with folder windows and with utilities like the Explorer and Find. An Explorer window is a folder window with an added left pane, All Folders, which shows a tree-structured hierarchy to help you navigate your system's drives, folders, and resources. Find shows the results of its searches in a folderlike pane. Some folders, like My Computer, Recycling Bin, and the Fonts folder, have added or reduced abilities, but are otherwise similar to drive / / / and directory folders.

Note: Keys to press are shown here in **boldface**. A bullet (•) links menu, button, option, check box, and drop-down list box names in a series. Elements you must provide are shown here in *italic*.

FOLDER AND EXPLORER WINDOW BASICS

Show/hide toolbar/status bar	**View** • **Toolbar**/Status **Bar**
Display contents as large icons/small icons/a list/ a list with details	/ / /; or right-click pane, **View** • Large Icons/Small Icons/**List**/**Details**; or **View** • Large Icons/Small Icons/**List**/**Details**
Sort Details or view contents	Click header to sort by; click again to reverse
Adjust width of Detail view field	Drag right edge of field's header
Set width of Detail view field to width of widest entry	Double-click right edge of field's header
Set option to view next opened folder in current/new window	**View** • **Options**, cursor to or click Folder option, OK
Override setting to view next opened folder	**<Ctrl>**-double-click folder
Close selected folder and all its parent folders	**<Shift>**-close folder
Set option to display/hide system and driver files/path in title bar/registered extensions	**View** • **Options** • View, click option, OK
Register new file type's extension, setting icon associated with file type, actions to appear on file's shortcut menu, and Quick View and extension display options	**View** • **Options** • File Types • **New** type. (For new icon: Change **Icon**, select icon (use Browse to find other files with icons), OK. **<Tab>**, type description, **<Tab>**, type extension, **New**, type action (open, print, etc.), **<Tab>**, type application to use or use Browse, repeat **New** to add action (to change default action, select action, **Set** Default), OK, set Quick View/extension display options, Close • Close
Edit registered extension	**View** • **Options** • File Types, double-click desired entry in Registered file **types** list
Unregister extension	**View** • **Options** • File Types, click desired entry in Registered file **types** list, **Remove** • **Yes** • Close
Cycle from toolbar's folder list box to folder window (in Explorer, from folder list box to left pane to right pane)	Click item; or **<F6>** or **<Tab>** until item is highlighted
Display toolbar's folder list	or **<F4>**
Update window's contents	**<F5>** or **View** • **Refresh**
Move up one folder level	or **<Backspace>**
Cut selected folder(s)/file(s) to Clipboard	or **<Ctrl>-X** or **Edit** • **Cut**

Fold Here

FOLDER AND EXPLORER WINDOW BASICS (continued)

Copy selected folder(s)/file(s) to Clipboard	or **<Ctrl>-C** or **Edit** • **Copy**
Paste from Clipboard	or **<Ctrl>-V** or **Edit** • **Paste**
Move selected folder(s)/file(s)	Drag to new location; or cut and paste
Copy selected folder(s)/ file(s) to new location	**<Ctrl>**-drag to new location; or copy and paste
Delete selected folder(s)/ file(s) (toss in Recycling Bin)	; or **<Delete>**; or right-click selection, **Delete**; or **File** • **Delete**
Permanently delete selected folder(s)/file(s)	**<Shift>-<Delete>**
Undo last file action, such as copy, move, or delete	or **<Ctrl>-Z** or **Edit** • **Undo**
View selected file(s) if viewer available for registered file type(s)	**File** or right-click selection, **Quick View**
Open properties dialog box of selected folder/file	; or **<Alt>-<Enter>**; or **<Alt>**-double-click folder/file; or right-click folder/file, **Properties**; or **File** • **Properties**

Fold Here

WORKING WITH THE EXPLORER

Open Explorer	Open Start menu, **Programs** • Windows Explorer; or right-click folder in folder window, **Explore**; or **<Ctrl>-<Shift>**-double-click folder in folder window
Select folder in left pane (showing folder's contents in right pane)	Click or cursor to tree pane folder; or double-click file pane folder; or display toolbar's folder list, select folder; or **<Ctrl>-G** or **Tools** • **Go To**, type drive/path/folder name or select from recently used drop-down list, OK
Expand tree to show branches below selected folder	⊞ or **<Right>** or **<Gray Plus>** or double-click folder
Expand tree to show all branches below selected folder	**<Gray Asterisk>**
Collapse tree to hide branches below selected folder	⊟ or **<Left>** or **<Gray Minus>** or double-click folder
Expand/shrink tree/file pane	Drag pane divider left/right
Open folder window	Right-click folder, **Open**; or select folder in right pane, **File** • **Open**

MANAGING DISKS AND DRIVES

Select floppy drive/hard drive/ CD-ROM drive/network drive	Display toolbar's folder list and select drive icon. In Explorer: **<Ctrl>-G**; or **Tools** • **Go To**, type *drive_letter*:\, OK
Format disk in selected drive	**File** or right-click drive icon, **Format**, choose type, choose other options, **Start**
Make disk bootable	**File** or right-click drive icon, **Format** • Copy system files • **Start**

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MICROSOFT WINDOWS 95 Part 2

MANAGING DISKS AND DRIVES (continued)

Copy selected disk	Right-click drive icon, **Copy**; or **File** • **Copy Disk**
Label selected disk	**File** or right-click drive icon, **Properties**, type name, OK
Open System Tools menu	Open Start menu, **Programs** • **Accessories** • **System Tools**
Defragment disk	Open System Tools menu, **Disk Defragmenter**, select disk, OK
Compress disk	Open System Tools menu, **DriveSpace**, select disk, **Drive** • **Compress** • **Start** • **Close**
Check disk for errors	Open System Tools menu, **ScanDisk**, select disk, **Start** • **Close** • **Close**
Backup files	Open System Tools menu, **Backup** • **Backup**, select file(s) to backup, Next Step, select destination, Start Backup, type set label, OK • OK • OK
Restore files	Open System Tools menu, **Backup** • **Restore**, double-click backup set, select file(s) to restore, Start Restore • OK
Compare backup files to originals to verify backup	Open System Tools menu, **Backup** • **Compare**, double-click backup set, select file(s) to compare, Start Compare • OK • OK

Fold Here

Assign drive letter to network computer or folder	; or right-click control menu (or or in title bar), **Map Network Drive**. Select drive, select path, OK
Remove work drive letter assignment	; or right-click control menu (or or in title bar), **Disconnect Network Drive**. Select drive, OK

WORKING WITH EXCHANGE

Open Exchange	Double-click Inbox on desktop or in Desktop folder window
Open additional Exchange window	**View** • **New Window**
Show/hide folder list	or **View** • **Folders**
Select folder	Click folder in folder list or double-click folder in contents pane
Move up one level in folder list	or **<Backspace>**
Create new Exchange folder in selected folder	**File** • **New Folder**, type name, OK
Display inbox/outbox/deleted/sent messages in message list	or **<Ctrl>-<Shift>-I** or Inbox/**<Ctrl>-<Shift>-O** or Outbox/Deleted Items/Sent Items
Sort message list by priority/type/attachment/sender/subject/date received/size in ascending/descending order	Right-click / / / From / Subject / Received / Size in message list, Sort **Ascending**/Sort **Descending**; or click / **<Ctrl>**-click header; or **View** • **Sort** • **Sort items by**, select column, change order, OK
Set message list columns	**View** • **Columns**
Mark selected message(s) as read/unread	**Edit** • Mark as **Read**/Mark as **Unread**

WORKING WITH EXCHANGE (continued)

Copy selected message(s)/folder(s) to another Exchange folder	**<Ctrl>-<Shift>-C**; or **File** or right-click message, **Copy**. Select destination, OK
Move selected message(s)/folder(s) to another Exchange folder	; or **<Ctrl>-<Shift>-M**; or **File** or right-click item, **Move**. Select destination, OK
Print selected message	; or **<Ctrl>-P**, OK; or **File** or right-click message, **Print** • OK
Save selected message in file	**<F12>**; or **File** or right-click message, **Save As**. (Optionally change name/location/type) **Save**
Delete selected message	; or **<Ctrl>-D**; or **File** or right-click message, **Delete**
Open selected message	Double-click message; or **<Enter>**; or **<Ctrl>-O**; or **File** or right-click message **Open**
Reply to selected message's sender	; or **<Ctrl>-R**; or **Compose** • **Reply to Sender**; or right-click message, **Reply to Sender**
Reply to selected message's sender and all its addressees	; or **<Ctrl>-<Shift>-R**; or **Compose** or right-click message, **Reply to All**
Forward selected message to new addressee	; or **<Ctrl>-F**; or **Compose** or right-click message, **Forward**

Fold Here

Start new message	or **<Ctrl>-N** or **Compose** • **New Message**
Find stored message	**<Ctrl>-<Shift>-F** or **Tools** • **Find**
Open address book	or **<Ctrl>-<Shift>-B** or **Tools** • **Address Book**
Manage message services	**Tools** • **Services**
Add toolbar buttons	**Tools** • **Customize Toolbar** • **Available Buttons**, select button, **Add** • **Close**
Remove toolbar buttons	**Tools** • **Customize Toolbar** • **Toolbar Buttons**, select button, **Remove** • **Close**
Set Exchange options	**Tools** • **Options**

WORKING WITH THE BRIEFCASE

Prepare file(s)/folder(s) to travel	Move or copy file(s)/folder(s) to Briefcase and move Briefcase to floppy disk
Synchronize selected Briefcase file(s) with original file(s)	; or right-click file, **Update**; or **Briefcase** • **Update Selection**. To change update action, right-click file in dialog box, ⇦ Replace / ⇨ Replace / Skip , **Update**
Synchronize all files in Briefcase	or **Briefcase** • **Update All**, confirm update action, Update
Show selected Briefcase file's update status	Open Briefcase file's Properties dialog box, Update Status
Locate original file for selected Briefcase file	Show file's update status, **Find Original**
Prevent future synchronization of selected Briefcase file(s)	**Briefcase** • **Split From Original** • **Yes** • Close

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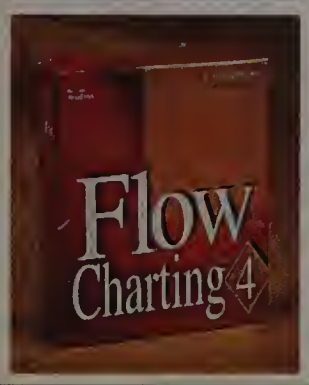

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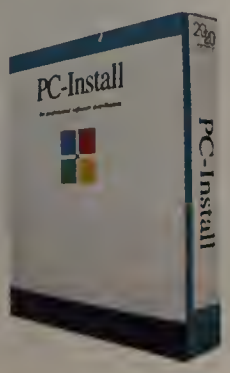

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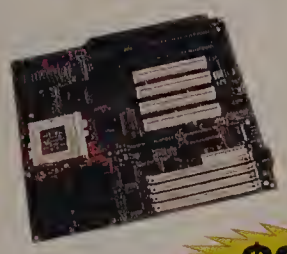

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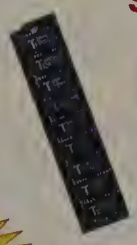

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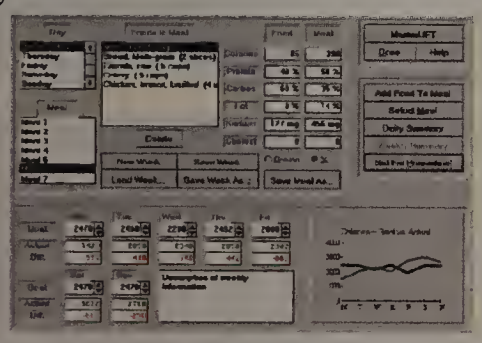

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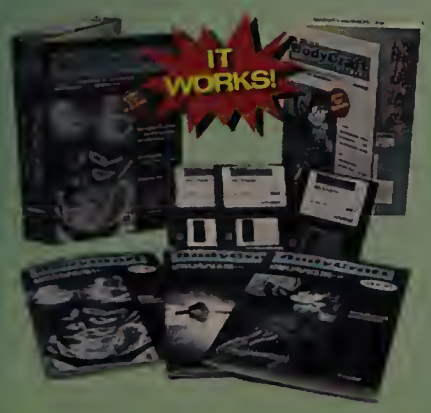

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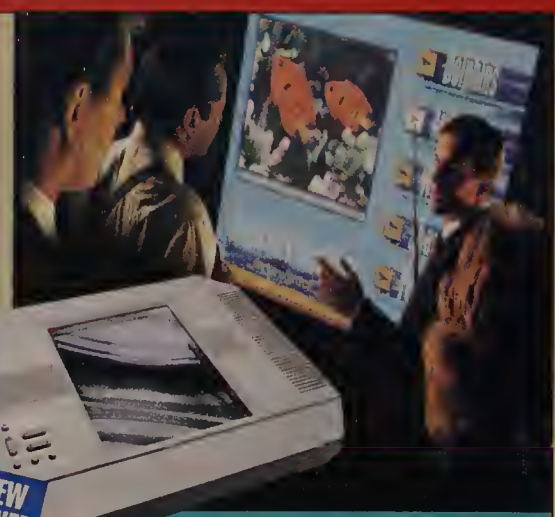

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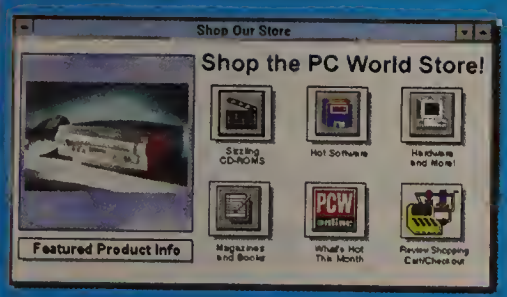

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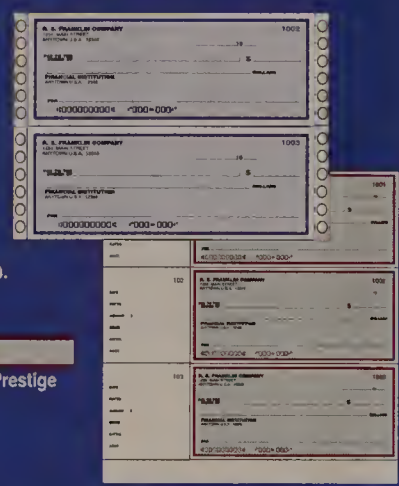

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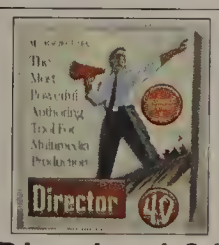

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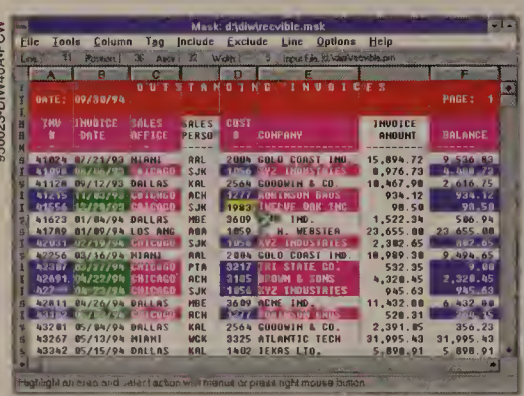

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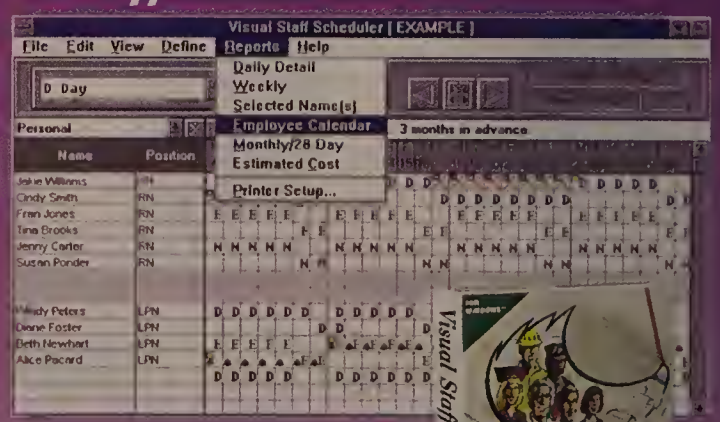

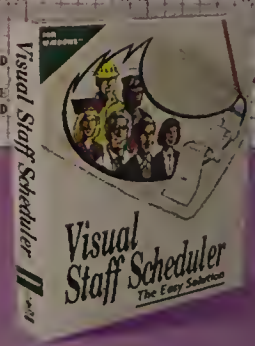

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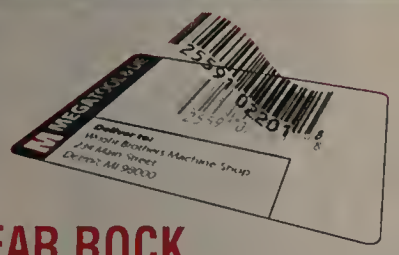

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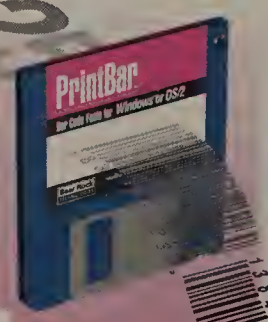

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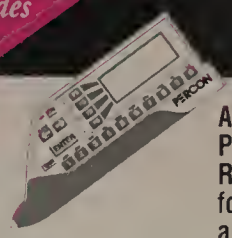

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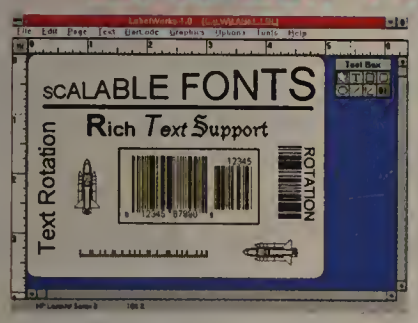

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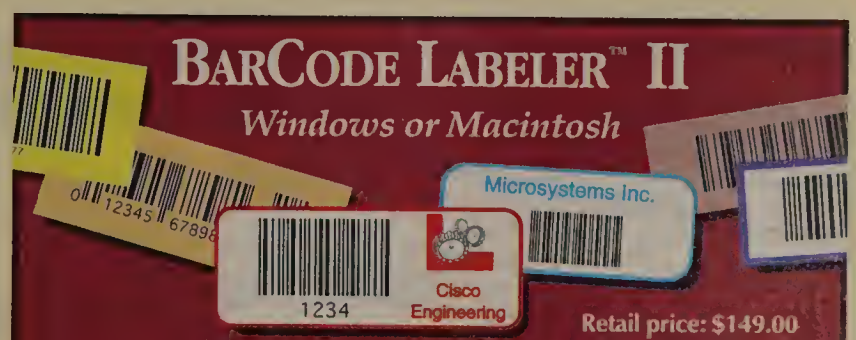

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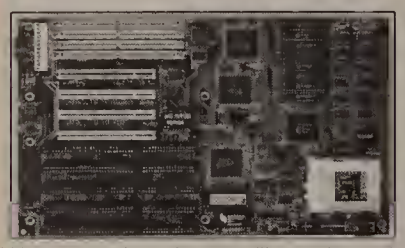

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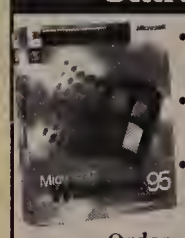

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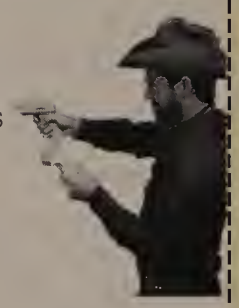

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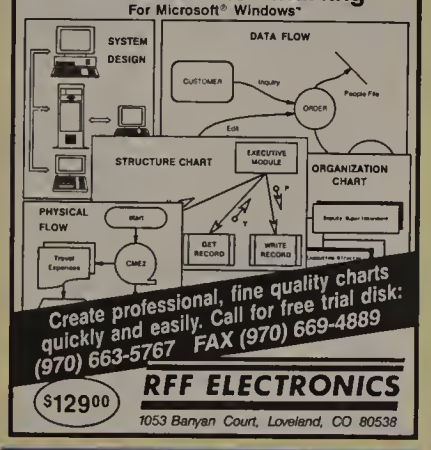

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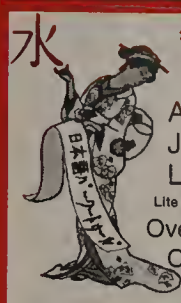

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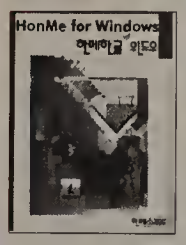

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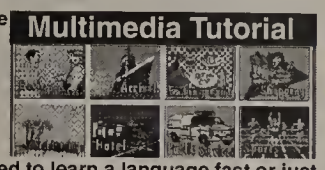

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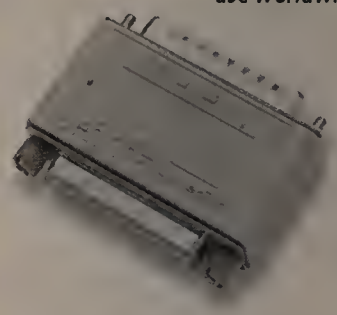

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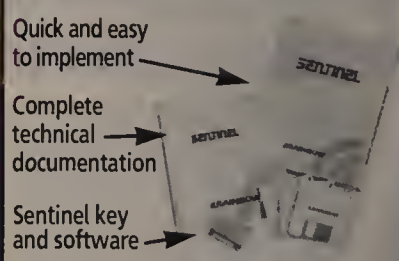

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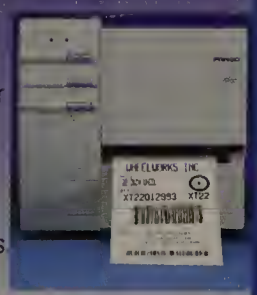

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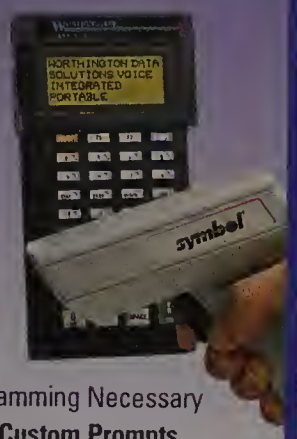

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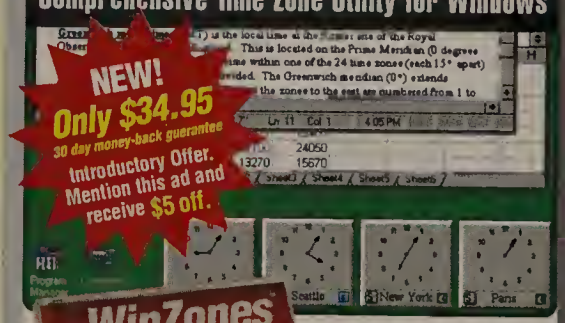

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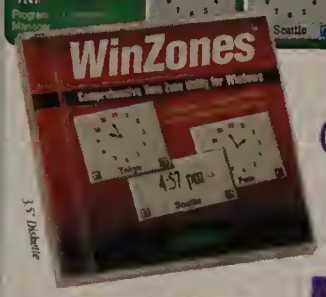

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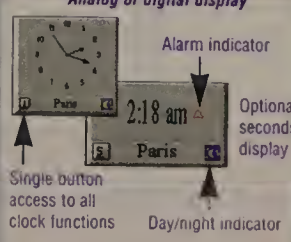

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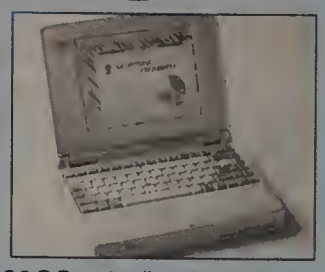

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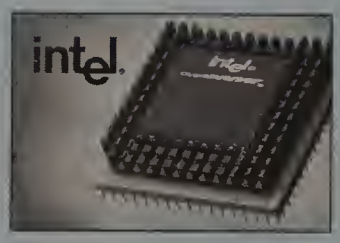

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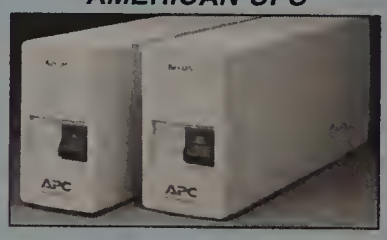

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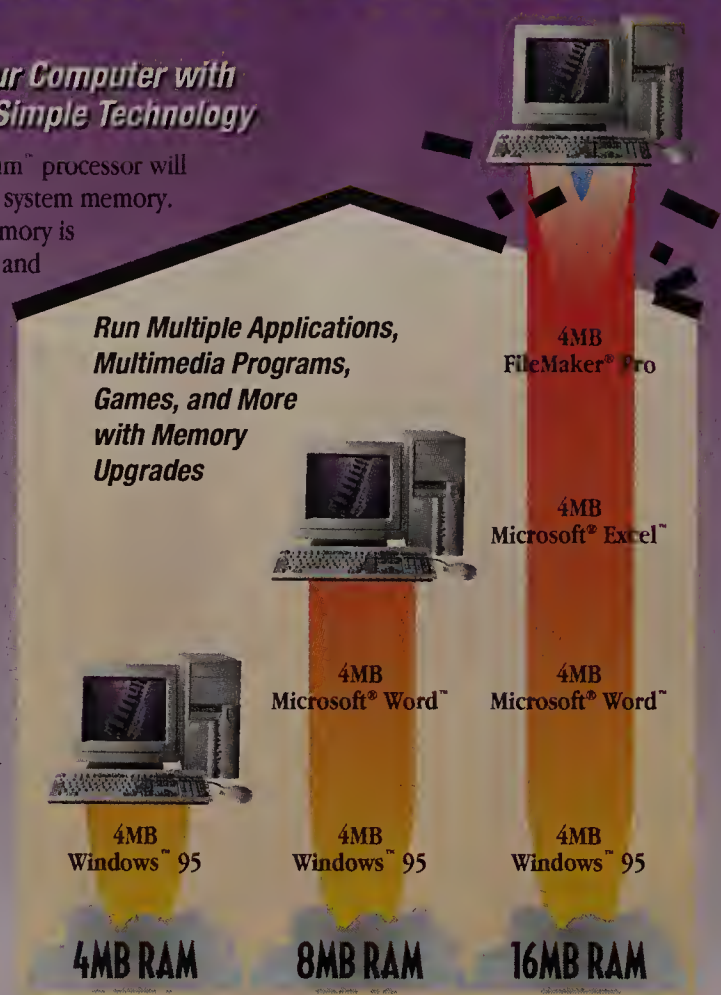

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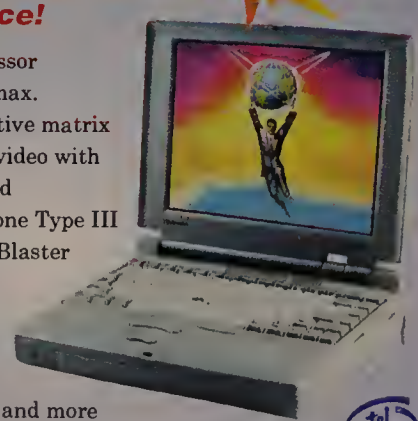

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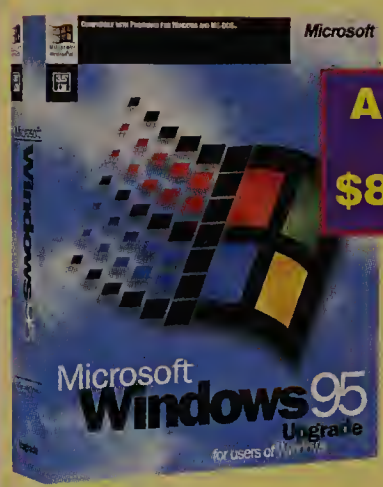

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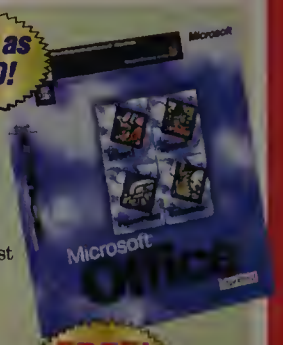

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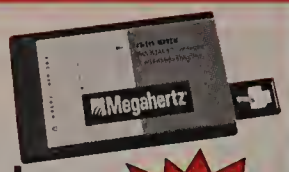

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Vi 14.4K internal w/fax & voice	113.59
Vi 14.4K external w/fax & voice	133.78
V.34 28.8K internal w/fax	179.88
Vi DSVD V.34 internal w/fax & voice	278.82
V.34 28.8K external w/fax	199.88
Vi 28.8K internal w/fax & voice	208.70
Vi 28.8K external w/fax & voice	225.33

COURIER MODEMS

V.34 Internal w/fax	387.60
V.34 external w/fax	422.32

Hayes

ACCURA 144 internal w/fax	91.87
ACCURA 144 external w/fax	111.18
ACCURA 288 V.34 internal w/fax	183.76
ACCURA 288 V.34 external w/fax	218.88
OPTIMA 144 external w/fax	374.30
OPTIMA 144 pocket w/fax	312.59
OPTIMA 288 V.34 internal w/fax	365.14
OPTIMA 288 V.34 external w/fax	419.44

PRACTICAL PERIPHERALS

14.4 internal w/fax	73.85
14.4 Mini Tower w/fax	89.76
V.34 28.8 internal w/fax	196.59
V.34 28.8 Mini Tower w/fax	209.64
Practical Pro Series	CALL

BOCA

Multimedia Voice Modem 14.4 internal	99.55
Online Express 14.4 internal w/fax	64.25
Online Express 14.4 external w/fax	79.78
V.34 28.8 internal w/fax	159.00
V.34 28.8 external w/fax	205.00

MICROCOM

Deskporte ES 14.4	146.39
Deskporte Fast ES V.34 28.8	179.94
Deskporte Fast EP V.34 28.8	239.99

MODEMS & COMMUNICATIONS

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V.34 FaxModem internal	142.89
V.34 FaxModem external	188.97
Voice FaxModem VFP 14.4VH internal	94.32
Voice FaxModem VFX 14.4V external	148.30
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14.4 V.32bis w/fax external	115.16

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SmartUPS 1000	516.64
SmartUPS 1400	597.74
SmartUPS 2200	1109.69
SmartUPS 3000	1757.74
SurgeArrest Network	33.25
SurgeArrest Pro	29.45
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Line-R 600	119.09

Tripp Lite

BC250	94.97	BC PRO 675	231.43
BC PERS 420	138.91	BC PRO 850	289.03
BC PRO 550	188.16	BC PRO 1050	327.59
BC PERS 500	173.09	BC PRO 1400	426.10

Tripp Lite Smart UPS Series

SMART 280 LAN	218.30	SMART 1050 LAN	455.07
SMART 450 LAN	273.94	SMART 1400 LAN	569.41
SMART 675 LAN	313.69	Isobar 4 OUTLET	38.95
SMART 850 LAN	389.74	Isobar 6 OUTLET	46.38

PCMCIA CARDS

3Com Etherlink IIIB combo	213.38
Adaptec APA1460 SCSI-2	209.69
Hayes EZJack 14.4 w.fax	169.75
Hayes EZJack V.34 w/fax	299.87
IBM Token Ring 16/4	336.57
Linksys Ethernet combo	167.56
Megahertz 14.4K data/fax	179.48
Megahertz XJack 14.4 data/fax	169.55
Megahertz XJack Gold 14.4 data/fax	198.89
Megahertz V.34 XJack data/fax	299.78
New Media Bus Toaster SCSI-2 host	197.92
New Media Wave Jammer sound card	229.48
New Media Multimedia Combo	439.80
Simple Tech 14.4K modem + voice	149.13
Simple Tech Ethernet 10BT adapter	129.16
Simple Tech SCSI adapter	145.51
Simple Tech 130MB hard drive	346.52
Simple Tech 170MB hard drive	404.60
SMC Elite Ethernet 10BT	126.13
SMC Elite Ethernet combo	173.77
Turtle Beach Audio Advantage	119.98
USR Sportster 14.4K	177.78
USR Sportster V.34	319.40
Xircom Ethernet 10BT	158.69
Xircom Ethernet combo	206.15
Xircom Ethernet+modem 10BT	319.69
Xircom Ethernet+modem combo	416.67
Xircom Token Ring 16/4	409.84

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Intel OverDrive DX2/50	125.68
Intel OverDrive DX2/66	139.79
Intel OverDrive DX4/75	149.78
Intel OverDrive DX4/100	194.62
Intel OverDrive Pentium 63MHz	285.37

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HP LaserJet 4P 4MB	CALL
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Toshiba 1900-4600 8MB	CALL
Toshiba 1900-4600 16MB	CALL
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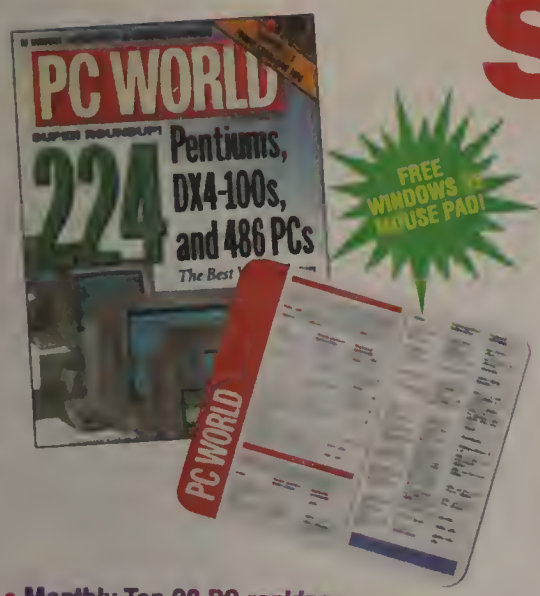

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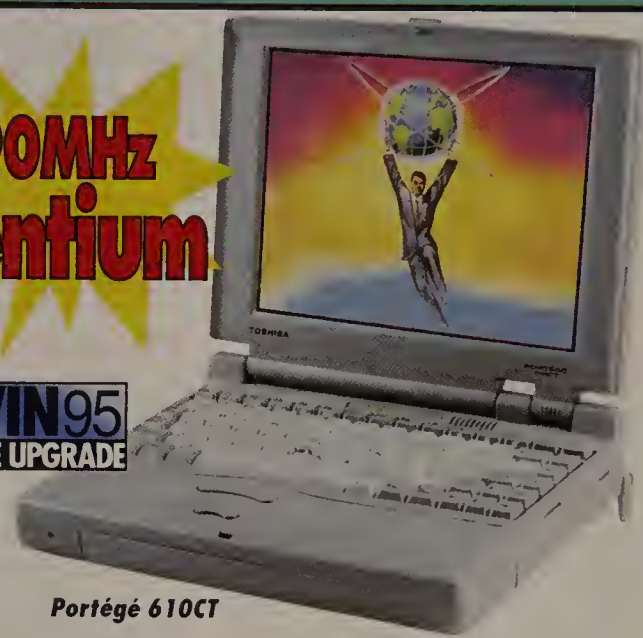
Satellite Pro 400

- Built-in 4X CD-ROM Drive(Swap floppy & CD-ROM) (Active model only, optional on Dual Scan)
- Pentium 75MHz Processor
- Built-in 16-bit sound, microphone, speaker & MIDI
- 10.4" Active & Dual Scan
- Built-in AC adapter - small, sleek design & reduced weight
- Integrated Accupoint - small, accurate & easy to use
- Lithium Ion battery technology
- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
Pentium 75MHz	10.4" Dual Scan	810MB	$3539
Pentium 75MHz	10.4" Active	810MB	4359

90MHz Pentium



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Portégé 610CT

Portégé 610CT

- Pentium 90MHz Processor
- 9.5" True Color display for optimum color
- Built-in Audio speakers/microphone, SoundBlaster ProCompatible
- Lithium Ion battery technology
- Accupoint stick for easy control

Processor	Screen	HD	Price
Pentium 90MHz	9.5" True Color	720MB	$4359

WIN95 FREE UPGRADE

T2110

WIN95 FREE UPGRADE

T2100

Satellite T2100

- Built-in AC Adapter for easy connections
- 4MB/28MB memory
- 2 Type II or 1 Type III PCMCIA slots
- **FREE** Windows 95 Upgrade

Processor	Screen	HD	Price
486DX2/50	9.5" Mono	250MB	$1199
486DX2/50	8.4" Active	330MB	2399

Satellite T2110/T2130

- 10.4" Dual Scan & Active
- Built-in AC adapter - small, sleek design & reduced weight
- Integrated Accupoint - small, accurate & easy to use

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	330MB	$1979
486DX4/75	10.4" Dual Scan	500MB	2459
486DX4/75	10.4" Active	500MB	3059

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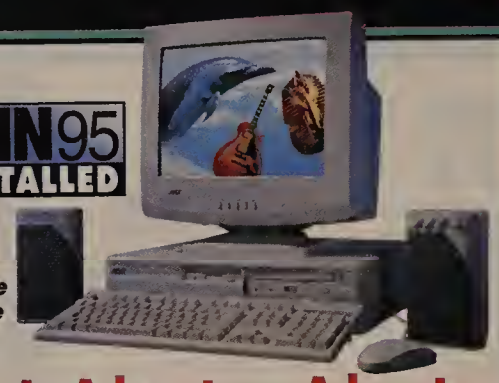

Additional Products from AST

Processor	Screen	HD	Price
Ascentia 950N (WIN95 INSTALLED)			
Pentium 75	10.4" Dual Scan	500MB	$3299
Pentium 75	10.4" Dual Scan	800MB	3589
Pentium 75	10.4" Dual Scan	1.2GB	4059
Pentium 75	10.4" Active	800MB	4719
Pentium 75	10.4" Active	1.2GB	5189
Ascentia 910N			
486DX4/75	10.3" Dual Scan	510MB	$2469
486DX4/75	10.3" Dual Scan	700MB	2649
486DX4/75	10.4" Active	510MB	3119
486DX4/75	10.4" Active	700MB	3199

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Advantage Adventure Multimedia (4X CD-ROM)

NEW for Windows 95

- Quad Speed CD-ROM Drive
- Advanced Telephony – 14.4 or 28.8 fax/modem, telephone answering system, and speaker phone (differs by model, call for details)
- Loads of **FREE** software preinstalled
- Windows 95 keyboard for increased productivity
- AST Works II navigation software – featuring "SPOT"

Chassis	Processor	HD	Price
Desktop (612)	Pentium 75	850MB	CALL
Minitower (812)	Pentium 100	1.2GB	CALL
Minitower (814)	Pentium 100	1.2GB	CALL*
Minitower (818)	Pentium 133	1.6GB	CALL*

Monitors priced separately **16MB RAM standard*

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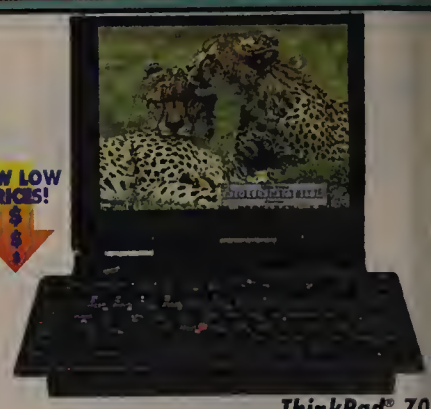


ThinkPad® 70

Additional IBM® Notebooks

Processor	Screen	HD	Price
ThinkPad®755			
4B6DX4/100	10.4" Active	540MB	$4649
486DX4/100	10.4" Active	810MB	5099
486DX4/100	10.4" Active	540MB	5649*
486DX4/100	10.4" Active	810MB	6099*
Pentium 75	10.4" Active	540MB	4749+
Pentium 75	10.4" Active	810MB	5199+
Pentium 75	10.4" Active	540MB	5799
Pentium 75	10.4" Active	810MB	6249
486DX4/100	10.4" Active LCD	540MB	6099
4B6DX4/100	10.4" Active LCD	540MB	7099*
486DX4/100	10.4" Active LCD	810MB	7549*

**Features Built-In CD-ROM drive*
+ Does not include built-in audio, telephony & modem

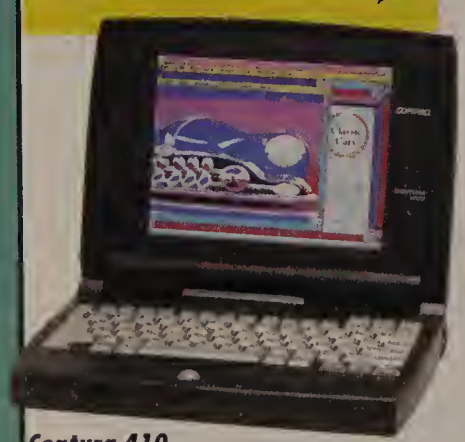
ThinkPad® 701

- Amazing pop-up, full-sized keyboard w/ jigsaw design
- 10.4" Active & Dual Scan
- Only 4.5 lbs. in subnotebook form factor
- 14.4 fax/modem, speaker phone, answering machine & voice mail
- Built-in 16-bit sound, microphone, speaker & MIDI
- Built-in infrared for no hassle printer connections
- 20 **FREE** software titles preinstalled

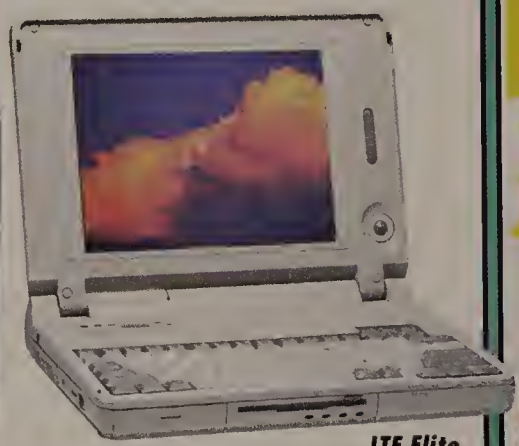
NEW LO PRICES

Processor	Screen	HD	Price
486DX2/50	10.4" Active	360MB	$2999
486DX2/50	10.4" Active	540MB	3299
486DX4/75	10.4" Dual Scan	360MB	3149
486DX4/75	10.4" Dual Scan	540MB	3449
486DX4/75	10.4" Active	360MB	3699
486DX4/75	10.4" Active	540MB	3999

COMPAQ



Contura 410
Product differs slightly from photo.



LTE Elite

Contura 420/430

- 10.4" Active & Dual Scan
- Fast 486DX4/75 or 486DX4/100 processors
- Optical trackball – smoother & more reliable
- High capacity drives – up to 720MB
- Compaq, 3-year worldwide warranty

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	420MB	$2459
486DX4/75	10.4" Active	420MB	3029
486DX4/100	10.4" Dual Scan	720MB	2839
486DX4/100	10.4" Active	720MB	3499

LTE Elite

- 10.4" Active Matrix display
- Fast 486DX4/75 processor
- Built-in AC adapter - small, sleek design & reduced weight
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
486DX4/75	9.5" Dual Scan	340MB	$2739
486DX4/75	9.5" Dual Scan	510MB	2999
486DX4/75	10.4" Active	510MB	4159
486DX4/75	10.4" Active	810MB	4539

HEWLETT® PACKARD

90MHz Pentium With PCI Bus

WIN95 INSTALLED

HP OmniBook 5000 Notebook PC

HP OmniBook 5000

- Pentium 90MHz with 32-bit PCI Local bus
- Up to 1.2GB drives available for high capacity storage
- High resolution – 800x600 resolution on notebook display
- Built-in 16-bit sound, microphone & speaker

Processor	Screen	HD	Price
Pentium 90	10.4" Active	1.2GB	$5579
Pentium 90	10.4" Active	1.2GB	6239*

**16MB RAM standard*

WIN95 INSTALLE

HP OmniBook 60

- Weighs as little as 3.8 lbs.
- Built-in infrared for no hassle printer connectio
- Instant "ON" ready-to-work state – lasts for months on a charge
- Built-in 16-bit sound, microphone & speaker (486DX4/75, 9.5" Active Model only)

NEW LO PRICE

Processor	Screen	HD	Pr
486DX2/50	8.5" Dual Scan	260MB	$21
486DX4/75	8.5" Dual Scan	260MB	25
486DX4/75	9.5" Active	260MB	30

HP LaserJet Printers

HP LaserJet 5P printer (IBM, 6ppm, 600dpi) ... $87
HP LaserJet 5MP printer (IBM&MAC, 6ppm, 600dpi) ... 103
HP LaserJet 4L printer (IBM, 4ppm, 300dpi) ... 49

HP InkJet Printers

HP DeskJet 320 printer (portable) ... $29
HP DeskJet 320 printer w/feeder ... 35
HP DeskJet 600 printer ... $28
HP DeskJet 600C printer ... 29
HP DeskJet 660C printer ... 38
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HP DeskJet 1200C printer ... 97
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HP OfficeJet ... $59
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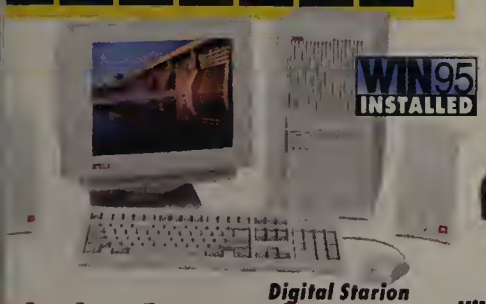


Digital Starion

WIN95 FREE UPGRADE
If purchased from July1–October 1, 1995

HiNote Ultra shown with Mobile Multimedia Station

Digital Starion
NEW! Windows 95 Multimedia Computers

- Quad Speed CD-ROM Drive
- Pentium 133 - fastest Pentium available!
- Unbelievable sound - SoundBlaster Pro-compatible, SW WaveTable, Premium JBL speaker system
- Advanced Telephony - 14.4 fax/modems (28.8 on 930 & 940 models only), full duplex speaker phone & answering machine
- Loads of **FREE** software preinstalled

Chassis	Processor	HD	Price
Minitower (910)	Pentium 75	850MB	$1749
Minitower (915)	Pentium 100	850MB	1999
Minitower (920)	Pentium 75	1.2GB	2199
Minitower (930)	Pentium 100	1.2GB	2499
Minitower (940)	Pentium 133	1.2GB	2999

Monitors priced separately

HiNote Ultra
- All models 4 lbs. or less - **ONLY 1.1" thick**
- Built-in sound, microphone & speaker
- Lithium Ion battery technology
- Built-in infrared
- 3-year warranty - **FREE** 1-year Passport Service
- **NEW Mobile Multimedia Option now available**

NEW LOW PRICES! $$$

Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	340MB	$2549
486DX2/50	9.5" Active	340MB	3079
486DX4/75	9.5" Dual Scan	528MB	3079
486DX4/75	9.5" Active	340MB	3319
486DX4/75	9.5" Active	528MB	3639

NEC

Versa 2000
- Lithium Ion battery technology
- VersaGlide touch-pad pointer – simple & accurate
- Built-in, upgradable 14.4 fax/modem (active models only)
- LOADS of **FREE** software preinstalled

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	350MB	$1999
486DX4/75	9.5" Active	350MB	2299*
486DX4/75	9.5" Active	350MB	2599
486DX4/75	9.5" Active	540MB	2799

**14.4 fax/modem not built-in*

Additional NEC Products

Chassis	Processor	HD	Price
NEC Ready Multimedia			
Minitower 5010	486DX4/100	540MB	$1499
Minitower 7020	Pentium 75	850MB	1799
Minitower 9010	Pentium 90	850MB	2099
Minitower 9510	Pentium 90	1.2GB	2499
Minitower 9520	Pentium 100	1.2GB	2799

Monitors priced separately

NEC Versa 4000
- Built-in CD-ROM drive! (Standard on some models, optional on others)
- Pentium 75 and Pentium 90 processors
- 256KB Level 2 Cache to optimize performance
- Unbelievable displays – 65K color Dual Scan, 16.8 million color Active(High resolution Active Matrix displays available – 800x600 res.)
- Built-in 16-bit sound, microphone, MIDI and 2 built-in speakers
- Multimedia docking station with outstanding Altec Lansing 4 speaker array

Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	540MB	$3499
Pentium 75	10.4" Dual Scan	540MB	3799*
Pentium 75	10.1" Active	540MB	4199
Pentium 90	10.1" Active	810MB	4899*
Pentium 90	10.4" High Res.	810MB	5099

** Features built-in CD-ROM drive standard*

PACKARD BELL

NEW! Windows 95 Multimedia Computers
- Quad Speed CD-ROM drive
- 16-bit SRS 3-D Amphitheatre Stereo sound
- PCI local bus, high-speed graphics
- Telephone answering system & fax/modem (full duplex speakerphone on selected models)
- LOADS of **FREE** software

Chassis	Processor	HD	Price
Minitower	Pentium 75	1GB	$1699
Minitower	Pentium 75	1.2GB	2019
Desktop	Pentium 100	850MB	1869
Minitower	Pentium 100	1.6GB	2449*+
Minitower	Pentium 133	1.2GB	2359+

**includes FostMedio Remote Control* *+28.8 fax/modem*

Monitors priced separately

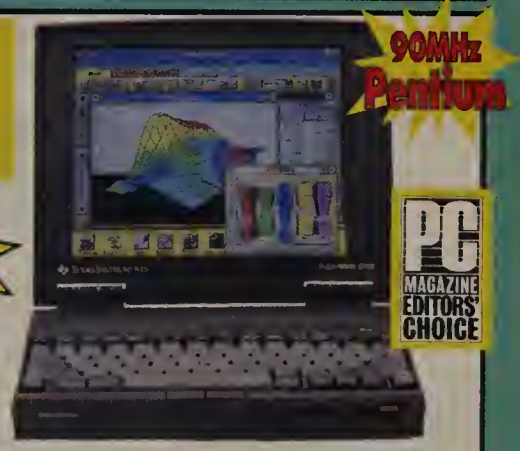
Force Desktop

WIN95 FREE UPGRADE

Force Minitower

TEXAS INSTRUMENTS

Extensa 450



Extensa 450
- 10.4" Dual Scan & 9.5" Active display
- GlidePad pointing device
- Advanced battery pro
- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	340MB	$1799
486DX4/75	9.5" Active	340MB	2399

TravelMate 5000/5100
- 75MHz or 90MHz Pentium with PCI Bus to optimize Pentium processor performance
- 10.4" Active Matrix display with 2MB Video RAM
- 10.5" Dual Scan display with 2MB Video RAM
- 65K colors on notebook display
- 16-bit Sound Card, Speaker, Microphone & MIDI
- Upgradable hard drive - easily add more storage
- Built-In Dual Lithium Ion batteries
- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	500MB	$3799*
Pentium 75	10.4" Active	772MB	4499*
Pentium 90	10.4" Active	1.2GB	5299

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- Integrated, enhanced EasyPoint Trackball
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486 DX2 40MHz
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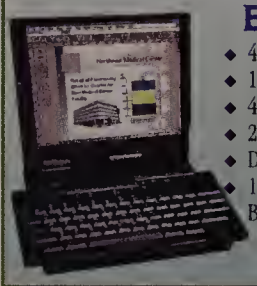

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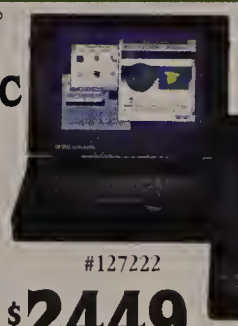

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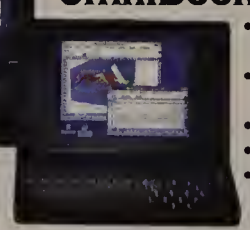

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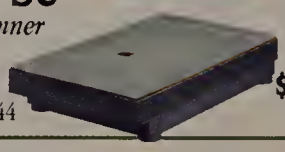

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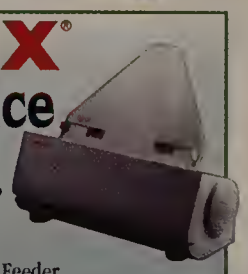

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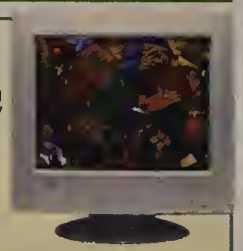

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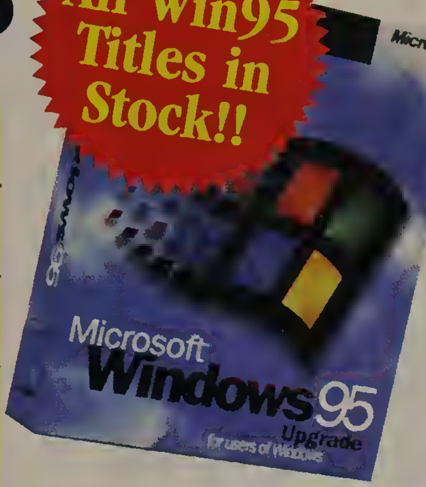

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8 x 32 32 mg EDO	–	–	–	1289.00	–	–

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Programs executed up to 3X faster • Plug & object code compat. w/Intel

83D87-40MHz – **79.00**   83D87-33MHz – **49.00**   83S87-25SX Ver. – **49.00**

83S87-33SX – **65.00**   PC Week™ rated #1 over all math chips

5 Year Warranty • "All Downward Compatible"

AST MEMORY

MODEL	AMT. UPGRADED	AST PART #	PRICE
Bravo LC Series, Bravo MT, Bravo MS, MS-L, Advantage Pro DX33, SX25	4Meg	500987-002	154.00
	8Meg	500987-003	308.00
	16Meg	500987-004	539.00
	32Meg	500987-005	1078.00
Premmia LX P/60, MX4/66d, 4/100T, P/60	8 Meg	500987-003	320.00
	16 Meg	501340-002	549.00
	32 Meg	500987-005	958.00
	64 Meg	501569-001	Call
Premmia 4133, 4133S, 4/50d, 4/60d	8 Meg	501159-002	338.00
Premmia SE 4/33, 4/66d, P/60	16 Meg	501159-003	658.00
Premmia MTE 4/33, 4/66d, P/60	32 Meg	501159-004	1149.00
Manhattan G, V Series Server	64 Meg	501159-005 (72 pin)	2298.00
Power Premium 3/33, 4/33, 4/33S, 4/50d, 4/66d; Premium 486/25, 486/25E, 486/33, 486/33E; Premium 386/33TE, 486/25TE, 486/33TE; Prem. II 386/25, 386/33, 486/33, 486 SX/20	8Meg	500780-001 (72 pin)	378.00
Bravo 486/25, 486/33; Advantage 486/25, 486/33, 486/33P, 486 SX/20	2 Meg Kit	500780-005	118.00
Premium SE4/22	8Meg Kit	500780-001 (64 pin)	378.00
Premium SE 4/50, d, 66d, P/60	1 Meg	500780-003 (64 pin)	59.00
Prem. 386/33T, 386 SX16, Prem.II 386SX 20, 386/25	4Meg	500780-004 (64 pin)	189.00
Premmia GX P/90, P/100	8Meg Kit/16MegKit	501565-001/501566-001	378/699
	32Meg Kit/64Meg Kit	501567-001/501568-001	1358/2699
AST Cupid Board	0-32 Meg	500818-001	179.00

AMBRA

Ambra Pentium-60	4/8/16 Meg	175.00/369.00/619.00
Ambra NC 42SSL	2/4/8 Meg	109.00/199.00/366.00
Ambra N Series	4/8/12/16 Meg	189.00/349.00/549.00/619.00
Ambra SN Series	4/16 Meg	189.00/639.00
Ambra Sprinta SLC II	2/8 Meg	89.00/319.00
Ambra N-75, N-100	4/8/16	189.00/369.00/619.00

MAGNAVOX

286/386SX-16, 386SX-20, 486SX-20 & 386-33 *all are 72PIN SIMM:*

1MEG – 59.00   4MEG – 169.00   8MEG – 349.00   16MEG – 619.00

ZENITH MEMORY MODULES

MODEL	AMT. UPGRADED	MFG. PART #	PRICE
Z386/33, 25, 20, 33E	1Meg	ZA3800ME	59.00
Z386/33, 25, 20, 33E, 486/25E	4Meg	ZA3800MK	169.00
Z386SX	2Meg	Z-605-1 modules	89.00

H.P. COMPATIBLE FONT CARTRIDGE

BAR CODES Bar Code Reader Fonts 99.00

DESKJET SOLUTION for DkJt 500 & Plus, 92 Fonts, 4.5 pt-30 pt 99.00

IBM 4019, 4019E, FONT CARTRIDGE 209 Fonts, Turbo Card 105.00

TURBO 25 Comparable to Pacific Data's 25 CARTRIDGES IN ONE!™, 143 Fonts *(compat. with Epson Action Laser II and all HP Printers)* 69.00

TURBOSCRIPT™ 109, 109 Scalable Fonts to Any Point Size HP20, 3, 30, 3P, 2P, 2P+ 149.00

TURBOSCRIPT™ 109, 109 Scalable Fonts to Any Point Size HP2 .... 179.00

TAX & FINANCE FOR IBM 4019, 4019E, 4029 .... 139.00

TAX & FINANCE CARTRIDGE 84.00

OKI 400, 800 41 fonts, 11 typestyles 169.00

MEMORY BOARDS
IBM Compatibles & PS/2

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16 BIT MEMORY BD. FOR 286, 386 AT • 0K-8Meg Bd. 4.0 LIM Compat. • New 5 Yr. Warr. Convent., Expnd. & Extnd. Memory • Supports DOS, OS/2, LIM/EMS & EEMS • Versatile Split Memory Addressing • Operates w/CPU Speeds to 33 MHz • Supports Desqview, Multitask operations • *Bd. made by Boca Research, AT plus*

0K – $84.00 2Meg – $159.00 4Meg – $239.00 8Meg – $399.00

BOCA XT 8 BIT BUS

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0-K – **$99.00**   1Meg **$189.00**   2Meg – **$229.00**

IBM P/S2 32BIT EXPANSION BD.

0-16Meg. Ext.-Expnd. Memory Bd. for P/S2 70, 80, 90, Lim 4.0

0Meg **$139.00** 2Meg **$238.00** 4Meg **$319.00** 8Meg **$499.00** 16Meg **$859.00**

PS/2 MCA 0-8MEG EXPANSION BD.

0-8Meg Extended and/or Expanded Memory for all IBM P/S2 Models 50, 50Z, 60, 55SX, 65SX, 16 Bit, 4.0 LIM Compat.

0K – 139.00 2Meg – 228.00 4Meg – 308.00 8Meg – 477.00

USES 1 X 9 SIMMS BOCA BR MC-80

BATTERIES

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IBM PS/1, PS/2 MEMORY MODULES

IBM PART NO.	WORKS WITH MODEL NO.	PRICE
30F5348 (512K)	30-286	37.00
30F5360 (2Meg)	30-286, 25-286, 50 MTHR BD.	104.00
6450375 (1Meg)	80-041	79.00
6450379 (2Meg)	80-111, 311-121, 321, 081, 161	84.00
6451060 (4Meg)	80-A21, A-61, 80-A31, 80-111, 89-311	189.00
6450604/92G7196 (2Meg)	70-061, E61, 121, 50Z, 55SX, 65SX, P-70, 55LS 65LS, X-Station 120 & 130, 35SX, 35LS, 40SX	99.00
6450608 (2Meg)	70-A21, A-81, B-21, B-61, 35SX, 35LS, 40SX, Val Pt. 325T	90.00
78X8955 (128K)	25	35.00
34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX, 55LS, 65LS	169.00
87F9977/92G7199 (4Meg)	55SX, 55LS, 65SX, 40SX, 35SX, 35LS	169.00
1057035 (512K)	P/S1-286	49.00
92F9935 (2Meg)	P/S1 & P/S1/386SX-2121	109.00
92F9694 (4Meg)	P/S1 & P/S1/386SX, Model-2121	189.00
92G7200 (4Meg)	PSI Expert, Consultant, Willow	169.00
92G7201, 73G3131 (4Meg)	Value Point Performance, PC Server 4/66	169.00
92G7539 (4Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	164.00
92G7541 (8Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	309.00
92G7543 (16Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	559.00
92G7545 (32Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	1149.00
73G3132/92G7203 (8Meg)	Value Point Performance, PC Server 4/66	349.90
60G1622/92G7204 (16Meg)	Value Point Performance, PC Server 4/66	699.00
92G7205 (32Meg)	Value Point Performance, PC Server 4/66	1239.00
6450902 (2Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC, Value Point 77 486DX2, 486SX, SVR 85	90.00
6450128/92G7200 (4Meg)	57SX, 90, 95, P-75, 57SLC, 56, 56SLC, P/S1, 386SX, Mod-2123, 2133, 2155, Val Pt 77, 486CS2, 486SX, SVR85, Value Point 77 486DX2, 486SX, SVR 85	189.00
6450129/92G7428 (8Meg)	35SX, 40SX	349.00
6450130/92G7202 (8Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC, Value Point 77 486DX2, 486SX, SVR 85	349.00
6451158/92G7208 (4Meg ecc)	486, 95XP; 95A (Install in pairs)	199.00
6451159 (8Meg ecc)	486, 95XP; 95A (Install in pairs)	399.00
92G7209/32G3720 (16Meg ecc)	9595 DPT	719.00

IBM NOTEBOOK & LAPTOP MEMORY

07G1415/07G1420 (4Meg)	Thinkpad 750, C, 700, C, 720, C, CL57SX	189.00
07G1416/07G1421 (8Meg)	Thinkpad 750, C, 700, C, 720, C, CL57SX	359.00
66G0095 (16Meg)	Thinkpad 750, C	829.00
66G0094 (4Meg)	Thinkpad 755, 360, 355, 340, 450	179.00
66G0094 (8Meg)	Thinkpad 755, 360, 355, 340, 450	349.00
66G0094 (16Meg)	Thinkpad 755, 360, 355, 340, 450	619.00
8189098 (4Meg)	Thinkpad 500, 510CS (3.3 volt)	189.00
8189099 (8Meg)	Thinkpad 500, 510CS (3.3 volt)	369.00
79F0999 (2Meg)	LX40, N33SX, PS Note	103.00
79F1999 (4Meg)	LX40, N33SX, PS Note, Tkpd 350, 350c, PS Note 425	189.90
79F1991 (8Meg)	LX40, N33SX, PS Note	349.00
Hard Drive (524Meg, 710 Meg))	Thinkpad 750, 755, 360, 355	829/929
(4Meg/16Meg)	Thinkpad 755 Dimm Modules	199/749
(4Meg/16 Meg w/Adap	Thinkpad 755	269/839
60G0378 (8Meg)	Thinkpad 350, 350c, PS Note 425	339.00
60G0379 (16Meg)	Thinkpad 350, 350c, PS Note 425	569.00
92F8804 (2Meg)	N45SL	109.00
92G7259 (4Meg)	Thinkpad 701C, CS, Butterfly	189.00
92G7261 (8Meg)	Thinkpad 701C, CS, Butterfly	369.00
92G7263 (16Meg)	Thinkpad 701C, CS, Butterfly	649.00
4Meg/8Meg/16Meg (730T only)	Thinkpad 340, 730T	219/359/709
8Meg/16Meg	Thinkpad 820	390/729
4Meg/8Meg/16Meg/32Meg	Thinkpad 850	193/399/719/1439
4Meg/8Meg/16Meg/32Meg	PC300 Pentium	179/339/629/1259

COMPAQ MEMORY MODULES

MODEL	AMT. UPGRADED	CMPQ PART #	PRICE
DeskPro 386/33, 386/33L, 486/25, 486/33L, 486/50L, System Pro	2Meg Module	115144-001	99.00
	8Meg Module	116561-001	349.00
	32Meg Module	116568-001	1399.00
DeskPro 386/33L, 486/33L	(Exp Bd)	116569-001	279.00
DeskPro 386/25, 386/20	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
DeskPro 386S-16MHz	1Meg Exp Bd	113633-001	149.00
	4Meg Exp Bd	113634-001	279.00
	1Meg Module	113646-001	79.00
	4Meg Module	112534-001	199.00
DeskPro 386/20E	1Meg Exp Bd	113644-001	149.00
DeskPro 386/25E	4Meg Exp Bd	113645-001	279.00
	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
DeskPro 286N, 386N, 386SX20, all "M" series, sytem LT series, all "I" series	1Meg Module	118688-001	59.00
	2Meg Module	118689-001	89.00
	4Meg Module	118690-001	169.00
	8Meg Module	128877-001	347.00
M Series Exp Bd	0-64Meg	129160-001	189.00
DeskPro 386/16	1Meg Kit	108071-001	99.00
	4Meg Kit	108072-001	299.00
	1-2Meg Exp Bd	108069-001	239.00
	4-8Meg Exp Bd	108070-001	437.00
DeskPro 286 (ALL OF THESE MACHINES USE THESE MODULES)	512K Kit	113012-001	49.00
DeskPro 5/60, 5/66M, 5/66M	8Meg Kit	149911-001	376.00
Prosignia 5/60	16Meg Kit	149949-001	676.00
Proliant 100 5/60	32Meg Kit	149912-001	1420.00
Proliant 2000 4/30, 5/66	64Meg Kit	149913-001	2476.00
Proliant 4000 4/50, 5/66	128Meg Kit	149914-001	5076.00
Prolinea 386 3/25S, 3/25ZS	2Meg	141738-001	90.00
	8Meg	141742-001	298.00
Prolinea 486 4/25S, 4/33, 4/50, 4/66, CDS	2Meg	141683-001	95.00
Enhanced Prolinea, Prosario series	4Meg	141684-001	169.00
	8Meg	141685-001	339.00
Prosignia PC Server, 486/33, 486 DX2/66	8Meg	141685-001	339.00
	16Meg	149320-001	629.00
	32Meg	149147-001	1289.00

COMPAQ LAPTOPS & NOTEBOOKS

LTE/286	4Meg Bd	117081-003	179.00
LTE/386S/20	4Meg Module	121125-002	219.00
LTE LITE/20, 25, 25C	4Meg Module	129769-002	219.00
LTE LITE/20, 25, 25C	8Meg Module	129769-003	439.00
LTE LITE/20, 25, 25C	16Meg Module	129769-004	669.00
LTE LITE 425C/33C/25E/25L	4Meg Module	142337-002	189.00
LTE LITE 425C/33C/25E/25L	8Meg Module	142337-003	349.00
LTE LITE 425C/33C/25E/25L	16Meg Module	142337-004	619.00
SLT/286	4Meg Module	110237-001	199.00
SLT/386	2Meg Module	118304-001	109.00
SLT/386	4Meg Module	118305-001	219.00
Concerto, LTE Elite	4Meg	144790-001	189.00
	8Meg	144790-002	353.00
	16Meg	144790-003	619.00
Contura 320, 325	2Meg	139497-001	99.00
	4Meg	139498-001	189.00
	8Meg	139499-001	339.00
Contura 400, 410	4Meg/8Meg/16Meg		189/369/619
Contura 420, 430	4Meg/8Meg/16Meg/20Meg		219/379/719/879
Contura 4/25, 4/25C, 4/25CX	4Meg	146520-001	189.00
	8Meg	146521-001	349.00
	16Meg	146531-001	619.00
Aero 4/25, 4/33	4Meg	190532-001	184.00
	8Meg	190597-001	349.00

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TOSHIBA LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
T2000SXE/2200SX/T1800, 1859, C	2Meg	PC-PA2000U	89
T2900SXE/2200SX/T1800, 1850, C	4Meg	PC-PA2001U	189.00
T2000SXE/2200SX/T1800, 1859, C	8Meg	PC-PA2002U	359
T2100, 2105, 2150	4Meg/8Meg		189/379
T2100, 2105, 2150	16Meg/24Meg		729/1134
T4400SX, SXC T6400, T6600	4Meg	PC-PA2004U	189.00
T4400SX, SXC T6400, T6600	8Meg	PC-PA2005U	379.00
T4400SX, SXC T6400, T6600	16Meg	PC-PA2010U	689.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	4Meg	PC-PA2012U	189.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	8Meg	PC-PA2013U	349.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	16Meg	PC-PA2014U	652.00
T4700, 4800, 4850 (Hard Drive)	524Meg/719Meg		799/1098
T3400CT, T2400, T3600	4Meg	PC-PA2019U	189.00
T3400CT, T2400, T3600	8Meg	PC-PA2020U	359
T3400CT T2400, T3600	16Meg	PC-PA2021U	619
T3400CT	32Meg		1549.00
T3100SX	2Meg	PC15-PA8308U	109.00
T3100SX	4Meg	PC15-PA8310U	189.00
T3200	3Meg	PC6-PA7137U	179.00
T3200SX	2Meg	PC12-PA8307U	119.00
T3200SX	4Meg	PC12-PA8909	199.00
T5200/T8500	2Meg	PC10-PA8304U	114.00
T5200/T8500	8Meg	PC10-PA8313U	419.00
T600, 610, CT	4Meg/8Meg/16Meg		Call

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
ACER 730, 735C, 760, 780	2Meg/4Meg/8Meg		109/199/3?9
ACER 763, 765, 782, 784, 788, 787	4Meg/8Meg/16Meg		199/379/719
ACER 750	4Meg/8Meg/16Meg		189/379/629
ALR Venture	4Meg	12407980	249.00
Altima Virage	4 Meg/ 16 Meg		199/679
Altima Virage II	4Meg/8Meg/16Meg		199/369/622
AST Advantage Adventurer 40660, 60660, 8066D	8Meg/16Meg/32Meg/64Meg		189/409/599/1262
AST Ascentia 900N, 800N	4Meg/8Meg/16Meg		189/379/629
AST Ascentia 950	8Meg/16Meg		419/759
AST Bravo & Explorer	4Meg/16Meg	501255-001, -002	189/679
AST Bravo MS-L P90	8Meg/16Meg/32Meg/64Meg		379/759/1249/2599
AST Notebook Prem Exec 386SX/20/25/25L	4Meg	500814-003	189.00
AST Power Exec 3/25C, 425EL, 425SL	4Meg/16Meg	501166-001, -003	199/629
AST Power Exec 4/33SL	4Meg/16Meg	501318-001,002	194/679
AT&T Globalyst 200	4Meg/8Meg/16Meg		199/389/679
AT&T Safari NSX/20	4Meg	PEC 37651	259.00
Austin DX4, DX2, SX2, SX Series	4Meg/16Meg		199/699
Bondwell B310, Plus	1Meg	23050-09100	69.00
Bondwell B310V, SX	1Meg/4Meg		109/229
Canon Innova Book 150	4Meg/16Meg		199/769
Canon Innova Book 200LS	4Meg/8Meg/16Meg/24Meg		189/379/639/Call
Canon Innova 486	2Meg/4Meg/8Meg		109/209/449
Canon Innova 486-10	4Meg/16Meg		189/639
Canon Notejet 486	4Meg/8Meg		199/389
Canon Notejet DX4/75	4Meg/8Meg/16Meg		299/379/679
Chaplet 486	4Meg/16Meg		199/879
Chicony NB5	4Meg/16Meg		199/679
Compuadd 425TX Notebook	4Meg/16Meg		199/699
DEC HiNote	4Meg/8Meg/16Meg		199/379/669
Dell Latitude M, MC, MCX	4Meg/8Meg/16Meg		189/379/639
Dell Latitude XP, 475, 4100, 4100CX	4Meg/16Meg		199/639
Dell Latitude 486, 425, 433C, 433CX, 450, 450CX	4 Meg/16 Meg		199/679
DTK 4T100P Notebook	4Meg/8Meg/16Meg		189/369/639
Epson ActionNote 650, 650c	4Meg/8Meg/16Meg		209/399/659
Epson ActionNote 700, 700c, 700cx	4Meg/16Meg		199/639
Epson ActionNote 880, 866c	4Meg/8Meg/16Meg/20Meg		Call/389/669/Call
Epson ActionNote 4000 Notebook	6Meg		279
Epson ActionNote 4LC/25, 4LC/33, 4SLC/2-50	2Meg/6Meg		119/279
Everex Tempo LX, LX20, Carrier	2Meg	PCA 00053-0001	109.00
Gateway 2000 Colorbook 4/33	4Meg/16Meg		199/619
Gateway 2000 Nomad 425 DXL/SXL	4Meg/16Meg		199/769
Gateway 2000 486 Handbook or Liberty	4Meg/16Meg		199/679
HP Omnibook 300, 480, 425	2Meg/4Meg		129/219
HP Omnibook 530, 600	4Meg/8Meg/12Meg		189/379/549
HP Omnibook 4000	4Meg/8Meg/16Meg		199/379/649
Leading Edge Aviva	4Meg/16Meg		199/639
Lexmark SE10	4Meg/8Meg		209/399
Magnavox Metalis	1Meg/4Meg	286, 386SX	109/199
Midwest Micro Elite SX-25, SX33, DX2-50, DX2-66	4Meg/8Meg/16Meg		199/389/629
Midwest Micro Elite Sndbk SX33, DX3-50, DX4-75, DX4-100	4Meg/8Meg/16Meg		199/389/629
Midwest Micro Elite Sndbk Plus D5-75, D5-90	4Meg/8Meg/16Meg		199/389/629
NCR Safari 3180	4Meg/ 8 Meg		189/369
NEC Prospeed 386	2Meg	PC31-21	119.00
NEC Prospeed 386	8Meg	PC31-22	399.00
NEC Prospeed 286, 386SX-16, 386SX-20	4Meg	PC21-22, PC43-22	199.00
NEC Ultralite Versa, E, V	4 Meg/8Meg/16Meg/20Meg	OP4104	183/359/619/799
NEC Versa Removable Hard Drive	540Meg/710Meg/810Meg		859/949/1033
NEC Versa S	4Meg/8Meg/16Meg		189/379/629
NEC Versa 2000C & 2000D	4Meg/8Meg/16Meg		199/379/799
Packard Bell 386SX, 286	1Meg, 4Meg	286, 386SX	109/179
Packard Bell Statesman	2Meg/8Meg		119/369
Panasonic CF170, CF270, CF370	1Meg	CF-BA185	59.00
Panasonic CF380, CF480	2Meg/4Meg/6Meg		119/199/309
Panasonic CF-V21P, CF-580	4Meg/16Meg		219/819
Panasonic CF-V41	4Meg/8Meg/16Meg/32Meg		219/419/692/1999
Sanyo 17/18 NB	2Meg	MBC-NBMEM2	109.00
Sharp 6781, 6881, 6785, 6700 6800, 6741	2Meg/4Meg		109/199
Sharp 8150, 8650, 8660, 7700, 7760	4Meg/16Meg		199/679
Sharp 8700 & 8900	4Meg/8Meg/16Meg		199/379/649
Sharp PC310, PC350, 3010 & 3050	4Meg/8Meg/16Meg		209/369/669
TI Travelmate 2000	1Meg	2568034-0001	79.00
TI Travelmate 3000	2Meg	2566996-1	84.00
TI 4000, TI 4000E	4Meg/16Meg		199/768
TI 4000M	4Meg/16Meg		199/768
TI 5000	4Meg/8Meg/16Meg		Call/419/793
Tandy 1510, 2810, 3810	1Meg		49.00
Tandy 2820, 3820, 3830	2Meg/4Meg/6 Meg		119/199/309
Twinhead, Altima, Compudyne, 486SX, DX, Tandy 4860	4Meg/16Meg		199/679
Twinhead Slimnote 5	4Meg/8Meg/16Meg		199, 379, 649
Ultra 486 TS38	4Meg/8Meg/16Meg		189/369/629
Zeos 386SX Notebook (not the + version)	2Meg		109.00
Zenith Master Sport 386SX	2Meg	ZA-300-1	114.00
Zenith Master Sport SL, SLE, 600, 620, 625NL	2Meg	ZA-4-4	104.00
Zenith Super Sport 286, 286E	1Meg	ZA-180-66	99.00
286E, SX	2Meg	ZA-180-64	119.00
SX Alpha/SX Beta	2Meg	ZA-180-86/ZA-180-87	119.00
Zenith Z-Note 425LN, LNC, LNP	4/8/16Meg		199/379/619
Zenith Z-Star 4/33	2/8Meg		119/369

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MODEL	PRICE	MODEL	PRICE
S-RAM Cards 1MEG	159	5250 IBM Emulatin Card	495
S-RAM Cards 2MEG	229	Bus Toaster (High speed SCSI II)	199
28.8/28.8 Data/Fax Modem	259	Wavjammer™ (16 bit stereo sound card)	275
14,400/14,400 Data/Fax Modem	119	Multimedia Combo, Sound/SCSI	499
Readwriter Card (15A Slot)	149	Panasonic KXL-D720 port CDRom player	339
Lan Ethernet Combo	Call	Type III 130 Mg Hard Drive	399
Lan Ethernet (10 Base T)	169	Type III 170 Mg Hard Drive	499
Lan Ethernet (Coax)	169	Xircom Combo Ethernet + Modem II 28.8 Adapter	549

FLASH MEMORY 2 Meg–109.00   6 Meg–299.00   10Meg–349.00   16Meg–529.00

LASER PRINTER MEMORY UPGRADES

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Brother 630, 631, 641, 645	–	–	89	135	–	–	–	–	–	–	–	–
Canon LBP 430	–	–	69	–	–	–	189	–	–	–	–	–
Canon LBP 860	–	–	–	99	–	–	179	–	–	349	669	1249
Canon LBP4, 4Lite, 4plus	–	–	159	219	–	–	–	–	–	–	–	–
Epson 6000, Action Laser	–	–	–	139	–	–	229	–	–	–	–	–
Epson Action Laser 1100, 1600	–	–	69	99	–	–	189	–	–	379	599	–
Epson Action Laser II	–	–	89	–	208	–	–	327	–	–	–	–
Epson 8000 1800, 4000, 4100, 4300	–	–	89	–	208	–	–	327	–	Call	Call	Call
Epson 1000, 1500, 5000, 5200	–	–	–	109	–	–	218	–	–	–	–	–
HP 2, 2D–	–	–	–	99	–	–	179	–	–	–	–	–
HP 3, 30, 3P, 2P 2P+	–	–	–	99	–	–	169	–	–	–	–	–
HP 4, 4M, 4SI, 4SIMX, 4P, 4MP	–	–	–	89	–	–	169	–	–	349	–	–
HP 4L	–	–	59	–	–	–	–	–	–	–	–	–
HP 3SI	–	–	69	–	–	–	169	–	–	349	–	–
HP 4SI	–	–	–	89	–	–	175	–	–	349	–	–
HP 5P	–	–	–	89	–	–	155	–	–	305	539	–
HP Design Jet 600, 650, 200	–	–	–	89	–	–	175	–	–	349	–	–
HP Deskjet 500, 500C, 510, 550, 560	–	55	–	–	–	–	–	–	–	–	–	–
HP Deskjet 1200C, 1200C/P	–	–	–	89	–	–	175	–	–	349	–	–
HP Laserjet	–	–	–	–	–	–	179	–	–	379	879	–
HP Paintjet XL300	89	–	–	–	–	–	249	–	–	428	837	–
IBM Laser 4019, 4019E	–	–	–	–	–	189	–	–	–	–	–	–
IBM Laser 4029, 4037	–	–	–	–	–	–	169	–	–	–	–	–
IBM Laser 4039, 4079	–	–	–	99	–	–	169	–	–	350	–	–
Konica LP-3110	–	–	119	189	239	–	–	–	–	–	–	–
NEC 90, 290	–	–	–	139	–	–	–	–	–	–	–	–
NEC 95, 97	–	–	–	99	–	–	–	–	–	–	–	–
Oki 400	–	–	–	104	–	–	–	–	–	–	–	–
Oki 400E, 400EX 410E 410EX	–	–	135	189	–	–	–	–	–	–	–	–
Oki 830, 840	–	–	–	109	–	–	–	–	–	–	–	–
Packard Bell PB 9500	–	–	–	139	–	–	227	–	–	–	–	–
Packard Bell 9815	–	–	–	159	–	–	269	–	–	–	–	–
Panasonic 4420/4450I	–	–	–	129	–	–	229	–	–	–	–	–
Panasonic 4410/4430	–	–	–	126	–	–	195	–	–	–	–	–
Panasonic 4450	–	–	99	–	–	–	–	–	–	–	–	–
Panasonic 4400/5400	–	–	89	129	–	–	229	–	–	–	–	–
Panasonic 4440, 5410	–	–	109	179	–	–	Call	–	–	–	–	–
Sharp 9400, 9460, 9600, 9700E	–	–	89	149	–	–	249	–	–	–	–	–
Sharp 9500, E, H 9700, H	–	–	109	–	–	–	279	–	–	–	–	–
TI XL/PS17/PS35	–	–	49	–	–	–	–	–	–	–	–	–
TI Microlaser Pro E, Powerpro, Pro 600	–	–	89	139	–	–	229	–	–	429	–	–
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Manufacturer	Systems	Specs	Model	Price
Acer	AcerNote 730 730c 735 735c AcerNote 760c/cx, 780cx	6V, 5000mAh, NiMH	B781	139.00
Apple	PowerBook 140 145/B PowerBook 150 160 165c PowerBook 170 180/c	6V, 2800mAh, NiCd	B141	54.00
	PowerBook 520/c, 540/c	9.6V, 1900mAh, NiMH	B101	54.00
	PowerBook Duo 210 PowerBook Duo 230, 250 PowerBook Duo 270c, 280/c	12V, 1600mAh, NiMH	B102	54.00
AST	Power Exec Advantage! Explorer Bravo NB	14.4V, 2400, NiMH 9.6V, 2400mAh, NiMH	B864 B662	129.00 119.00
AT&T	SAFARI NSX/20 3170	12V 1400MAH, NICD	B090	B9.00
Cannon	Innova Book 200LS NoteJet III	10.3V, 2400mAh, NiMH 12V 2400mAh, NiMH	B794 B795	
Compaq	LTE Lite 20/25/E/C LTE Lite 4/25/E/C, 4/33C Contura 3/25/C Contura 4/25/C/CX Contura Aero 4/25	12V, 2200mAh, NiMH 12V, 2400mAh, NiMH 10.8V, 1500mAh, NiMH	B266 B291 B260	159.00 129.00 79.00
	Contura Aero 4/25/C, 4/33/C Contura 400C/CX, 410C/CX	10.8V, 2400mAh, NiMH	B261	119.00
Epson	ActionNote 4000 ActionNote 4SLC2-50 ActionNote 4SLC/33 ActionNote 500C	9.6V, 1700mAh, NiCd 9.6V 1700mAh, NiCd	B968 B963	79.00 79.00
	ActionNote 500C	9.6V, 2400mAh, NiMH	B998	129.00
	ActionNote 650/C, 660CY	12V, 2600mAh, NiMH	B992	169.00
	ActionNote 700/C/CX	84 v, 2200mAh, NiMH	B999	Call
	ActionNote 866/CX, 880CY	12v, 1800mAh, NiMH	B908	Call
IBM	PS/2 Note L40SX ThinkPad 300 ThinkPad 355/C ThinkPad 360/Cs/C/P	10.8V, 2400mAh, NiCd 12V, 2500mAh, NiMH 9.6V, 2900mAh, NIMH	B379 B380 B306	79.00 169.00 129.00
	ThinkPad 700/C, 720/C	10.8V, 3000mAh, NIMH	B378	129.00
	ThinkPad 750/Cs/C/P ThinkPad 755Cs/C	9.6V, 3300mAh, NiMH	B307	209.00
NEC	UltraLite SL/20/0, SL/25C Versa E Versa V Versa S	12V, 1700mAh, NiCd 7.2V, 3700mAh, NIMH 12v, 1800mAh, NIMH	B079 B089 B093	69.00 129.00 Call
Packard Bell	PB286NB PB386NBX Statesman	4.8V, 5000mAh, NiCd 14.4V, 1700mAh, NiCd	B575 B565	54.00 129.00
Sharp	PC-7700, PC-7750 PC-8150, PC-8650/II, PC-8660 PC-8700 PC-8900	14.4V, 2300mAh, NiMH 14.4V, 1800mAh, NiMH	B005 B007	189.00 169.00
TI	TravelMate 3000 TravelMate 4000/E TravelMate 4000M	4.8V, 5000mAh, NiCd 12V, 2500mAh, NiMH	B847 B809	59.00 129.00
Toshiba	T1000SE, XE, LE T1200XE T1200 T2000SX/SXE	7.2v, 1800mAh, NiCd 7.2V, 2200mAh, NiCd	B437 B488	Call 59.00
	T2000SX, T3300SL T4400/SX/SXC/C T4500/C, T4600/C T1800, T1850C T1900/C, T1910/CS T1950/CS/CT, T1960CS/CT T2400CS/CT, T2450CT T4700CS/CT, T4800CT, T4850CT, T4900CT	14.4V, 2400mAh, NiMH 16.8V, 2400mAh, NiCd 9.6V, 3000mAh, NiMH 9.6V, 2800mAh, NiCd 12V, 2600mAh, NiMH	B489 B490 B492 B487 B491 B403	159.00 169.00 319.00 169.00 79.00 129.00
Zenith	Z-Note Series	12V, 2500mAh, NiMH	B095	149.00

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Manufacturer	Systems	Model	Price
Apple	PowerBook 140, 145, 145B PowerBook 150, 160, 165c PowerBook 170, 180, 180c	C106	159.00
Compaq	Contura Aero 4/25, 4/25C Contura Aero 4/33, 4/33C Contura 400C, 400CX, 410C, 410CX	C203	159.00
Epson	ActionNote 4SLC2-50 ActionNote 4SLC/33, 500 ActionNote 800, 866C, 880CX, 880CY	C905 C906	159.00 159.00
IBM	ThinkPad 355, 355C ThinkPad 360, 360Cs, 360C, 360P, 360LE, 360CSE ThinkPad 750/Cs/C/P 755 Cs/C	C304	159.00
NEC	UltraLite Versa E, Versa V	C001	159.00
Sharp	PC-8700, PC-8900	C002	159.00
TI	TravelMate 3000, 4000, 4000E TravelMate 4000M	C807 C812	159.00 159.00
Toshiba	T1900, T1900C, T1910, T1910CS T1950, T1950CS/CT, T1960CS/CT T2400CS/CT T2450CT, T4700CS/CT T4800CT T4850CT, T4900CT	C402	Call
	T4500, T4600 T2100, T2100CS, T2100CT, T2105, T2105CS, T2105CT T2150CDS, T2150CDT	C401 C421	199.00 Call

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Acer	AcerNote 730/c, 735/c, 760c/cx, 780/cx AcerNote 750	M702 M705	89.00 89.00
Apple	PowerBook 140, 145/B, 150 PowerBook 160, 165/c, 170, 180/c PowerBook 520/c, 540/c PowerBook Duo 210, 230, 250 PowerBook Duo 270/c, 280/c	M100 M105 M101	89.00 88.00 89.00
AST	Advantage! Explorer Bravo NB	M607	B9.00
Canon	BJ-10E Innova 486NX Innova 486TX NoteJet 486/C, NoteJet II 486C	M701 M702 M705 M703	89.00 89.00 89.00 B9.00
Compaq	Contura 3/25/C 4/25/C, 4/33/C Concerto Contura Aero 4/25/C, 4/33/C Contura 4/33/C Contura 400C/CX 410C/CX	M202 M203	89.00 89.00
	LTE Lite LTE Lite/25 25C/25E LTE Lite 4/25/25E 4/33C	M204	89.00
Dell	Latitude 433C	M607	89.00
Epson	ActionNote 4SLC2-50, 4SLC/33 500C ActionNote 866C, 880CX	M908 M906	89.00 89.00
IBM	ThinkPad 355/c, 360/Cs/C/P ThinkPad 700/C, 720/C, 750/Cs/C/P, 755Cs/C ThinkPad 500	M301 M306	89.00 89.00
NEC	Versa S	M001	89.00
Sharp	PC-8150, PC-8650 PC-8650 II, PC-8660 PC-8700 PC-8900	M002 M004	89.00 89.00
TI	TravelMate 4000/E TravelMate 4000M	M801 M803	89.00 89.00
Toshiba	T1800, T1850/C T4500/C, T4600/C	M403	89.00

MICROBOLT DC AUTO ADAPTER (Cont'd)

Manufacturer	Systems	Model	Price
	T200 DynaPad T3400 Portégé, T3600 Portégé T1900/C, T1910/CS T1950/CS/CT, T1960/CS/CT T2400CS/CT, T2450CT T4700CS/CT, T4800CT, T4900CT	M401	89.00

DELL

Model No.	Capacity	OEM Part No.	Price
Dimension 425SV, 433SV, 466V	4MB	310-3325	155.00
Dimension XPS 450V, 460V, 4100V	16MB	310-3327	539.00
Dimension XPS P60, P90, P100	4MB**	310-3325	155.00
	8MB**	********	310.00
	16MB**	310-3327	539.00
	32MB**	********	1118.00
Low Profile Power Desktop 486P/16, 20, 25, 33, 50, 66	1MB	310-2505	59.00
Power Desktop 486D/16, 20, 25, 33, 50, 66	4MB	310-2507	169.00
	16MB	310-2625	619.00
OptiPlex 425x/L(V), 433s/L(V), 450/L(V), 466/L(V) OptiPlex 425x/MX(V), 433S/MX(V), 450/MX(V), 466/MX(V) Performance 425s/L, 433/L, 433s/L, 450/L, 466/L Performance 425s/M 433/M, 433s/M, 450/M, 466/M			
Pertormance 425s/ME 433/ME, 433s/ME, 450/ME, 466/ME	4MB	310-3325	155.00
Pertormance 433/T, 450/T, 466/T	16MB	310-3327	539.00
OmniPlex 433/ME, 450/ME, 466/ME, 4100/ME	4MB**	310-3325	155.00
OptiPlex 560/L, XL 575, XL 590, XMT 590	8MB**	********	310.00
PowerEdge XE 433, 433s, 450, 466	16MB**	310-3327	539.00
	32MB**	********	1118.00
OmniPlex 560/ME, 566/ME, 590/ME, 5100/ME			
PowerEdge SP 433, 450, 466	8MB (kit)**	310-3335	338.00
PowerEdge SP 560, 566, 590, 5100	16MB (kit)**	********	710.00
PowerEdge XE 560, 566, 590, 5100	32MB (kit)**	310-3337	1238.00
4000/XE Series 486/33, 486/50, 486/66	64MB (kit)**	********	2598.00
PowerLine Servers 420SE, 425SE, 433SE	2MB (kit)	310-2466	118.00
PowerLine Servers 450SE, 450SE/2, 466SE	4MB (kit)	310-2467	188.00
PowerLine Workstations 420DE, 425DE, 433DE	8MB (kit)	310-2468	338.00
PowerLine Workstations 450DE, 450DE/2, 466DE	16MB (kit)	310-2469	710.00
	32MB (kit)	310-2630	1238.00
System 325D, 325P, 333D, 333P	1MB	310-2505	59.00
System 433P	4MB	310-2507	169.00
System 325N & 325NC Notebook	2MB	310-3210	109.00
System 425TE, 433TE	2MB (kit)	310-2466	89.00
	4MB (kit)	310-2467	179.00
	8MB (kit)	310-2468	369.00
	16MB (kit)	310-2469	639.00
System NL20, 25 Notebook	2MB	310-3213	109.00
System 4xx/V, 4xxs/V, 4xx/DV, 4xxs/DV	4MB	310-3325	155.00
	16MB	310-3327	535.00

* * Install memories in pairs

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Model No.	Capacity	OEM Part No.	Price
AlphaStation 200 4/166	8MB (kit)**	FR-PC77M-AA	338.00
AlphaStation 200 4/233	16MB (kit)**	FR-PC77M-AB	710.00
AlphaStation 400 4/233	32MB (kit)**	FR-PC77M-AC	1238.00
	64MB (kit)**	FR-PC77M-AD	2598.00
Celebris 466, 4100, 560, 590	4MB	FR-PC74M-AA	169.00
Celebris ** 590	8MB (kit)**	FR-PC77M-AA	338.00
	16MB	FR-PC74M-AB	619.00
	16MB (kit)**	FR-PC77M-AB	710.00
	32MB (kit)**	FR-PC77M-AC	1238.00
	64MB (kit)**	FR-PC77M-AD	2598.00
DECpc AXP 150	16MB (kit)	PB2MA-BD	710.00
	64MB	PB2MA-BF	3294.00
DECpc LPx 433sx, 433dx, 450d2, 466d2 DECpc LPx+ 433sx, 433dx, 450d2, 450s2, 466d2, 4100 DECpc LPv 425sx, 433dx, 433sx, 450d2, 466d2 DECoc KDv+ 425sx, 433sx, 433dx			
DECpc LVv+ 450d2, 450s2, 466d2, 4100	4MB	FR-PC74M-AA	169.00
DECpc MT 433dx, 450d2, 466d2	16MB	FR-PC74M-AB	619.00
DECpc MTE 433dx, 466d2, 4100	4MB	FR-PC74M-AA	169.00
	16MB	FR-PC74M-AB	619.00
	32MB	********	1269.00
	64MB (kit)	FR-PCT7M-AA	2598.00
DECpc 425ST, 433ST, 450ST, 452ST, 466ST, 560ST	4MB	PCTAM-CC	169.00
	8MB	PCTAM-CD	355.00
	16MB	PCTAM-CE	619.00
	32MB	PCTAM-CF	1299.00
DECpc LPx 560, 566	8MB (kit)**	FR-PC77M-AA	338.00
DECpc XL 434dx, 466d2, 4100, 560, 566, 590	16MB (kit)**	FR-PC77M-AB	710.00
DECpc XL Server 466, 4100, 560, 566, 590	32MB (kit)**	FR-PC77M-AC	1238.00
	64MB (kit)**	FR-PC77M-AD	2598.00
DEC 2000 ALPHA AXP 300	16MB (kit)	PB2MA-BD	716.00
	64MB (kit)	PB2MA-BF	2556.00
	128MB (kit)	********	5196.00
HiNote CS433, CS450, CT450, CT470 notebook	4MB	FR-PCP7M-AA	199.00
HiNote Monochrome 433 notebook	8MB	FR-PCP7M-AB	379.00
	16MB	FR-PCP7M-AC	649.00
VAXstation 4000 VLC	8MB (kit)	MS40-BA	738.00
Venturis Slimline 433sx, 450s2, 466, 4100, 560	4MB	FR-PCVAM-AA	155.00
Venturis Slimline Multimedia 466	8MB	FR-PCVAM-AB	309.00
Venturis® Full Profile 450s2, 466, 4100	16MB	FR-PCVAM-AC	539.00
Venturis® Multimedia 466	32MB	FR-PCVAM-AD	1149.00

* * Install memories in pairs

EPSON

Model No.	Capacity	OEM Part No.	Price
Endeavor 4SX/25C, 4DX/33C, 4DX2/50C	2MB	A808591	89.00
Endeavor WG 42X/33, 4DX/33, 4DX2/50, 4DX2/66	4MB	A808601	169.00
	16MB	A880051	619.00
Endeavor 486L 486SX/25, 486SX/33	1MB	********	59.00
Endeavor 486L 486DX/33, 486DX2/50, 486DX2/66	4MB	********	155.00
	16mb	********	539.00
Endeavor VL 486SX/25, 486SX/33	4MB	********	155.00
Endeavor VL 486DX/33, 486DX2/50, 486DX2/66	16MB	********	539.00
Endeavor P60	4MB**	********	155.00
	8MB**	********	309.00
	16MB**	********	535.00

* * Install memory modules in pairs

NEC

Model No.	Capacity	OEM Part No.	Price
Express RISCserver	4MB	DP-410-30001	169.00
RISCserver 2200	8MB	DP-410-30002	355.00
RISCstation 2000	16MB	DP-410-30003	619.00
	32MB	DP-410-30004	1169.00
* * Install memory modules in quads			
Image 425, 433, 466	4MB	DP-410-12002	169.00
	16MB	DP-410-12003	619.00
Image 450es, 466es, 4100es	4MB	DP-410-30001	169.00
Image 450m, 466m, 4100m	8MB	DP-410-30002	355.00

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NEC (Continued)

Model No.	Capacity	OEM Part No.	Price
	16MB	OP-410-30003	819.00
	32MB	OP-410-30004	1299.00
Image P60, P90 P90E, P100E Image RISCstation PowerMate P60D, P60M Ready P60M	4MB	DP-410-30001	189.00
	8MB	OP-410-30002	355.00
	16MB	OP-410-30003	619.00
	32MB	OP-410-30004	1299.00
PowerMate 386/33I	1MB	OP-410-6204	59.00
	4MB	OP-410-6205	169.00
	16MB	OP-410-6206	619.00
PowerMate 425es, 433es, 450es, 566es	4MB	OP-410-30001	169.00
Ready 425es, 433es, 466es	16MB	OP-410-30003	619.00
PowerMate 433D, 466D, 466M, 4100M	4MB	OP-410-14003	155.00
Ready 433D, 466D, 466M, 4100M	8MB	OP-410-14004	309.00
	16MB	OP-410-14005	539.00
	32MB	OP-410-14006	1149.00
PowerMate Express 486SX/20e, 486SX/25e, 486/50e	1MB	OP-410-8204	59.00
	4MB	OP-410-6205	189.00
PowerMate Express 486/33e, 486DX2/66E			
PowerMate Express 486SX/25Te, 486/33Te	1MB	DP-410-6204	59.00
PowerMate Express 486/50Te, 486/66Te	4MB	OP-410-6205	169.00
	16MB	OP-410-6206	619.00
PowerMate Express/II 433ST, 486ST	4MB	OP-410-30001	169.00
	16MB	OP-410-30003	619.00
	32MB	OP-410-30004	1269.00
PowerMate Express/II 4100ST	4MB	OP-410-30001	169.00
PowerMate Express/II P60LT, P66LT, P90LT	8MB	DP-410-30002	355.00
PowerMate Express/II P60ST, P66ST	16MB	DP-410-30003	619.00
	32MB	OP-410-30004	1269.00

* * Install memory modules in pairs

HEWLETT PACKARD

Model No.	Capacity	OEM Part No.	Price
NetServer LE 486SX/33, 486DX/33, 486DX2/66	4MB	D2156A	169.00
	8MB	D2152A	355.00
	16MB	D2676A, D2297A	639.00
	32MB	D2298A	1299.00
NetServer 4/66LC, 4/100LC, 5/66LC NetServer 4/66LF, 5/66LF NetServer 4/66LF, 5/66LF			
NetServer 4/33 LM, 4d/66 LM	4MB**	D2974A	169.00
NetServer 5/60 LM, 5/66 LM	8MB**	D2975A	355.00
NetServer 5/66 LM2, 5/90 LM, 5/100 LM	16MB**	D2297A	619.00
	32MB**	D2298A	1299.00
Vectra 386/25 PC Vectra 486/33ST, 486/66ST Vectra 486/25U PC, 486/33U PC Vectra 486/50U PC, 486/66U PC	2MB**	D2381A	94.00
	8MB**	D2152A	369.00
Vectra 486 PC, 486s/20	1MB**	D2150A	59.00
Vectra 486/25T, 486/33T PC	2MB**	D2381A	94.00
	4MB**	D2156A	179.00
	8MB**	D2152A	369.00
Vectra 486/25M PC, 486s/33M PC, 486/33M PC Vectra 486/25MI PC, 486s/33MI PC, 486/33MI PC Vectra 486/25N PC, 486/33N PC, 486/50N PC, 486/66N PC	2MB	D2381A	94.00
Vectra 486/33NI PC, 486s/33NI PC	4MB	D2156A	169.00
Vectra 486s/33XM PC, 486/33XM PC	8MB	D2152A	355.00
Vectra 4886/50XM PC, 486/66XM PC	16MB	D2676A, D2297A	619.00
Vectra M2 4/25, 4/25i, 4/33s, 4/33si, 4/50, 4/50i, 4/66	4MB	D2974A	169.00
Vectra N2 4/33s, 4/33si, 4/50, 4/50i, 4/66, 4/100	8MB	D2975A	355.00
Vectra VL2 4/25e, 4/33s, 4/33se, 4/tp, 4/66, 4/100	16MB	D2297A	619.00
Vectra XM2 4/50, 4/50i, 4/66, 4/66i, 4/100, 4/100i	32MB	D2298A	1269.00
Vectra 486/25VL, 486/33VL, 486/66VL	4MB	D2156A	169.00
	8MB	D2152A	355.00
	16MB	D2676A, D2297A	619.00
Vectra VL2 5/60	4MB**	D2974A	169.00
Vectra XP/60	8MB**	D2975A	369.00
Vectra XU 5/90 PC, 5/90C PC	16MB**	D2297A	639.00
Vectra XU 5/90 PC, 5/90C PC	32MB**	D2298A	1299.00

* * Install memory modules in pairs.

ACER

Model No.	Capacity	OEM Part No.	Price
AcerAcros 4000 series	1MB	72.25636.158	
	2MB	72.51236.158	
	4MB	72.00136.038/91.00029.902	
	8MB	72.00236.038/91.00029.903	
	16MB	72.00436.038/91.00029.904	
AcerAcros 6000 series	1MB	72.25636.158	
	2MB	72.51236.158	
	4MB	91.40429.901	
	8MB	91.00029.903	
	16MB	91.00029.904	
	32MB	n/a	
AcerPower 6000 series	4MB	72.00136.038	
AcerPower 9000 series, 9000T series**	8MB	72.00236.038	
AcerPower Pentium series**	16MB	72.00436.038	
	32MB	n/a	

* * AcerPower 9000T and Pentium series. Install memory modules in pairs

SUN

Model No.	Capacity	OEM Part No.	Price
SPARCstation 1 (SUN 4/60), 1+ (SUN 4/65), IPC (SUN 4/40) SUN 3/60, 3/80, 4/110	4MB (kit)	X104C	176.00
SPARCstation 2 (SUN 4/75)	16MB (kit)	X116H	676.00
SPARCserver 5	16MB (kit)	X116H	676.00
	8MB	X108M	379.00
	32MB	X132M	CALL
SPARCengine 10			
SPARCserver 10	16MB	X116F	749.00
SPARCstation 10	64MB	X164F	2399.00
SPARCserver 20	16MB	X116O	732.00
	32MB	X132P	1464.00
	64MB	X164P	2562.00
SPARCserver 330	8MB (kit)	X108E	352.00
SPARCstation 330, 370, 390	32MB (kit)	X134A	1352.00
SPARCserver 630MP, 670MP, 690MP	64MB (kit)	X168A	2516.00
	256MB (kit)	X146A	CALL
SPARCserver 1000	32/128MB (kit)	X163A	1708.5026
SPARCcenter 2000	64/256MB (kit)	X173A	3416/10,052
SPARCstation Classic LC (SUN 4/15), LX (SUN 4/30)	8MB (kit)	X108R	359.00
	32MB	X132R	1220.00
SPARCstation ELC (SUN 4/25)	4MB	X104D	199.00
SPARCstation IPX (SUN 4/50)	16MB	X116D	619.00
SPARCstation SLC (SUN 4/20)	4MB	X105Z	179.00

* * Install memory modules in pairs only

ZENITH

Model No.	Capacity	OEM Part No.	Price
Z-Select 100 Z-425S, Z-433D, Z-433S, Z-450X, Z-466X	4MB	AME-70-UG	155.00
	16MB	AME-120	539.00
	32MB	AME-100	1149.00
Z-Select 100XE 433SX, 450SX/2, 4660X/2, 41000X/4	4MB	AME-70	155.00
	8MB	AME-73	309.00
	16M8	AME-71, AME-120	539.00
	32MB	AME-72, AME-100	1149.00
Z-Select PT	8MB (kit)**	AME-410	338.00
	16M8 (kit)**	AME-420	710.00
	32MB (kit)**	AME-430	1238.00
	64MB (kit)**	AME-440	2598.00
Z-Server 425SE, 433DE, 450DE	4MB (kit)**	ME-432	178.00
	8MB (kit)**	ME-102	338.00
	16MB (kit)**	ME-442	710.00
	32MB (kit)**	ME-92	1238.00
Z-Server EX 433DE, 450DE, P663	4MB (kit)**	ME-432	178.00
Z-Server LT 433DE, 466XE, P60E	8MB (kit)**	ME-102	338.00
	16MB (kit)**	ME-442	710.00
	32MB (kit)**	ME-92	1238.00
	64MB (kit)**	********	2598.00
Z-Station 420SEh, 420SEn, 420Sh, 420Sn, 425Sh	1MB	ME-70	59.00
Z-Station 433DEh, 433DEh, 450XEn	4MB	ME-100	179.00
	16MB	ME-90	639.00
Z-Station EX	8MB (kit)**	AME-410	338.00
	16MB (kit)**	AME-420	710.00
	32MB (kit)**	AME-430	1238.00
	64MB (kit)**	AME 440	2598.00
Z-Station 500	4MB (kit)**	AME-400	178.00
	8MB (kit)**	AME-410	338.00
	16MB (kit)**	AME-420	710.00
	32MB (kit)**	AME-430	1238.00
	64MB (kit)**	AME-440	2598.00
Z-Station 510	4MB	AME-70	155.00
	8MB	AME-73	309.00
	16MB	AME-71	619.00
	32MB	AME-72	1149.00

* * Install memory modules in pairs

ZEOS

Model No	Capacity	OEM Part No.	Price
Pantera 486SX-33, 486DX-33 486DX2-66, 486DX4-100	4MB	RAM-0004	155.00
Pantera Pentium-66, Pentium-90**	8MB	RAM-0008	309.00
	16MB	RAM-0016	539.00
	32MB	RAM-0032	1149.00

* * For Pentium systems, install memory in pairs only

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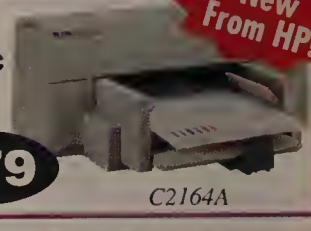

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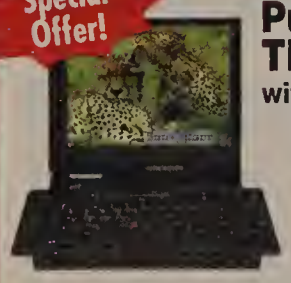

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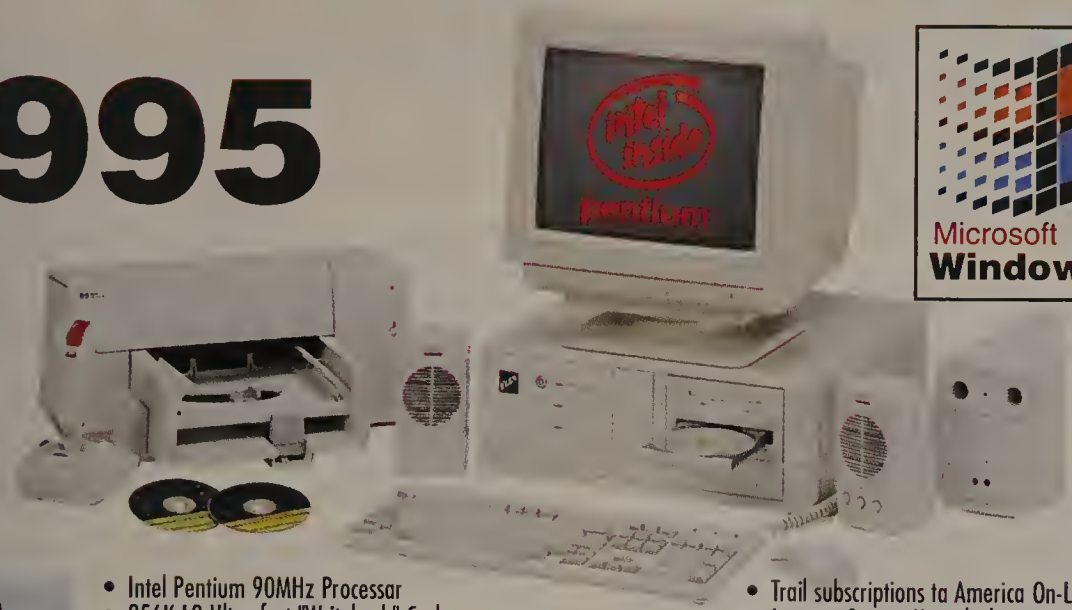

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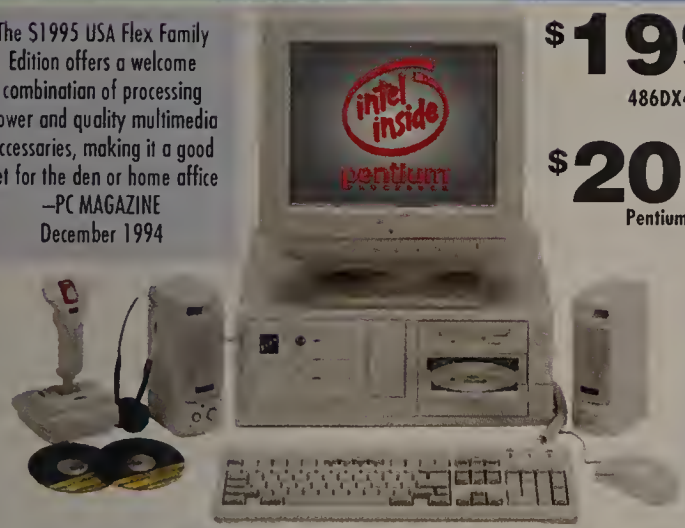
The $1995 USA Flex Family Edition offers a welcome combination of processing power and quality multimedia accessories, making it a good bet for the den or home office
–PC MAGAZINE
December 1994

$1995 486DX4-100

$2095 Pentium 75MHz



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*Upgrade only available at time of system purchase.

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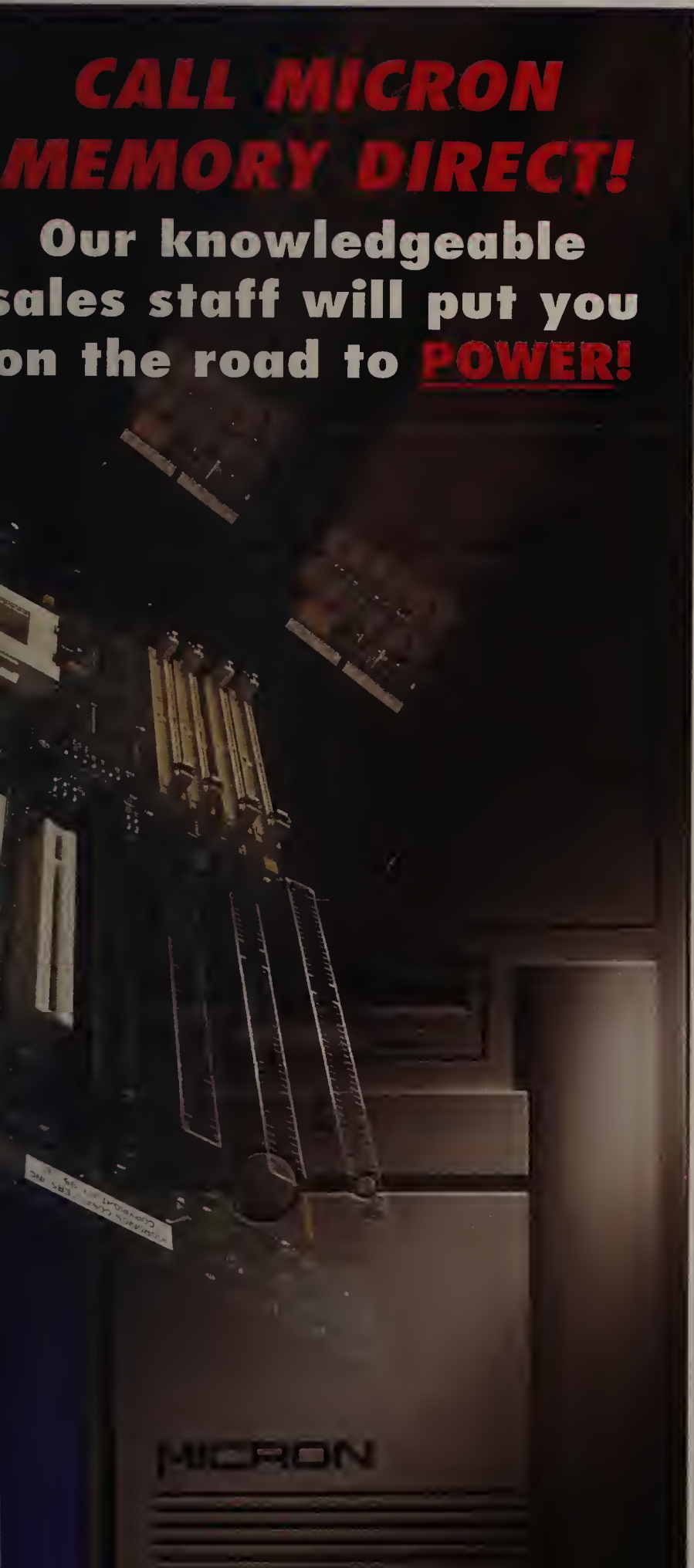

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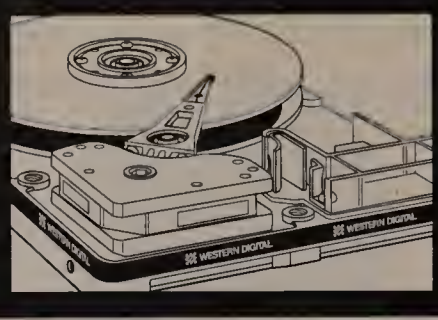

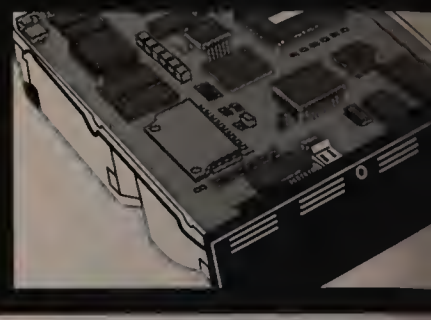

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2-4Gig	Conner	C4324RP	$869	$969
2-4Gig	HP	35480	$869	$969
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Fujitsu Features 5400rpm!				
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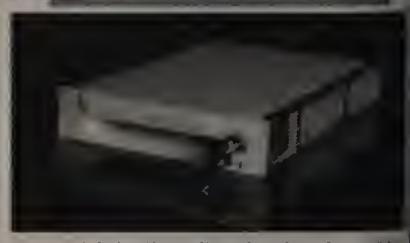

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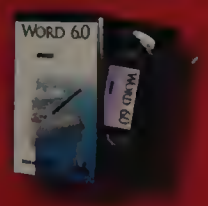

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ST31220A	1.05GB	9MS	IDE	279-453
ST31230N	1.00GB	10MS	SCSI-2	495-630
ST11900N	1.7GB	9MS	SCSI-2	999-1124
ST12400N	2.1GB	9MS	SCSI-2	949-1174
ST32430N	2.1GB	10MS	SCSI-2	835-998
ST43400N	3.5GB	11MS	SCSI-2	1100-1275
ST15230N	4.2GB	9MS	SCSI-2	1079-1394
ST410800N	9.0GB	11MS	SCSI-2	2450-2684
SCSI-BARRACUDA-7266 RPM				INT EXT
ST32550N	2.1GB	8MS	SCSI-2	969-1094
ST15150N	4.2GB	8MS	SCSI-2	1469-1594

Maxtor

FACTORY NEW-2 YEAR WARRANTY				INT-EXT
M7425AV	425MB	12MS	IDE	170-320
M7540AV	540MB	12MS	IDE	180-330
M7850AV	853MB	12MS	IDE	239-389
M71260AV	1.2GB	12MS	IDE	305-475
M76226AP	1.6GB	12MS	IDE	430-590
MXT540A	540MB	8.5MS	SCSI	345-465
MXT540S	540MB	8.5MS	SCSI	345-465

CONNER

FACYORY NEW-1 YEAR WARRANTY				INT-EXT
CFS425A	420MB	13MS	IDE	$153-306
CFS540A	540MB	12MS	IDE	174-330
CFS850A	850MB	10MS	IDE	224-379
CFS1275A	1.3GB	10MS	IDE	278-480
CFP1080S	1.06GB	9MS	SCSI-2	449-584
CFP2105S	2.1GB	9MS	SCSI-2	840-1000
CFP2107S	2.1GB	9MS	SCSI-2	955-1080
CFP4207S	4.2GB	9MS	SCSI-2	1299-1424

NOTEBOOK HARD DRIVES

TOSHIBA

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MK2326FC	340MB	15MS	IDE	299
MK2526FC	524MB	15MS	IDE	399
MK2428FC	520MB	15MS	SCSI	449
MK2628FC	810MB	13MS	IDE	499

IBM

IBMHON520	520MB	IDE	$650

Seagate

ST9150AG	131MB	16MS	194
ST9385AG	340MB	16MS	269
ST9550AG	455MB	16MS	399
ST9655AG	524MB	16MS	409

Quantum

DY256AT	256MB	17MS	IDE	$259
DY514AT	514MB	17MS	IDE	415
DY256S	256MB	17MS	SCSI	259
DY514S	514MB	17MS	SCSI	429

CONNER

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CFC	64MB	17MS	322

FUJITSU

M2637T	240MB	17MS	$295

NEC

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D3725	730MB	11MS	IDE	199-347
FACTORY NEW-3 YEAR WARRANTY				INT-EXT
D3727	1.1GB	11MS	IDE	309-459
D3827	1.1GB	11MS	SCSI	399-424

MICROPOLIS

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MC2217A	1.75GB	10MS	IDE	875-1025
MC4110	1.05GB	9MS	SCSI-2	650-775
MC2217	1.75GB	10MS	SCSI-2	875-1000
MC4221	2.05GB	8.5MS	SCSI-2	880-1055
MC1936	3.0GB	11MS	SCSI-2	895-1095
MC3243	4.3GB	8MS	SCSI-2	1139-1239
MC1991	9.0GB	11MS	SCSI-2	2119-2254
MC4221AV	2.05GB	8.5MS	SCSI-AV	979-1024
MC1936AV	3.0GB	11MS	SCSI-AV	999-1119
MC3243AV	4.3GB	8.5MS	SCSI-AV	1239-1399
MC1991AV	9.1GB	10MS	SCSI-AV	2219-2344

WESTERN DIGITAL

FACTORY NEW-3 YEAR WARRANTY				INT-EXT
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WDAC2850	850MB	10MS	IDE	215-374
WDAC31200	1.2GB	10MS	IDE	315-484
WDAC31600A	1.6GB	9MS	IDE	549-699

FUJITSU

FACTORY NEW-5 YEAR WARRANTY				INT-EXT
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M2684S	530MB	13MS	SCSI	185-325
M1606S	1.1GB	9.5MS	SCSI	359-554
M2915S	2.1GB	9.5MS	SCSI	845-994
M2934S	4.3GB	8.9MS	SCSI	1139-1424

SAMSUNG

FACTORY NEW-2 YEAR WARRANTY				INT-EXT
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PS/2 50, 50Z, 80, 70, 80, P70, 55SX

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IDE	169	SCSI-2	$179

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			INT-EXT
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DSP5400	4GB	12MS	SCSI	2479-2604

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C2490	2.1GB	8.9MS	SCSI	999-1154

Quantum

FACTORY NEW-2 YEAR WARRANTY

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30540MVS	540MB	14MS	SCSI	189-314
LIGHYNING IDE & SCSI-2 SERIES				INT-EXT
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30730LTA	730MB	11MS	IDE	239-389
30540LTS	540MB	11MS	SCSI	199-324
30730LTS	730MB	11MS	SCSI	269-394
TRAIL BLAZER SERIES				INT-EXT
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30420TRA	420MB	12MS	FSCSI-2	179-304
30850TRA	850MB	12MS	ATA-2	249-N/A
30850TRA	850MB	12MS	FSCSI-2	269-394
THUNDERBOLY SERIES				INT-EXT
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FIREBALL SERIES				INT-EXT
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30540FBS	540MB	12MS	FSCSI-2	199-324
31080FBA	1.08GB	12MS	ATA-2	279-N/A
31080FBS	1.08GB	12MS	FSCSI-2	399-554
EMPIRE FASY SCSI-2 SERIES				INT-EXT
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CAPELLA FASY SCSI-2 SERIES				INT-EXT
VP32210S	2.2GB	8.5MS	3.5"X1	769-974
ATLAS FAST SCSI-2 SERIES				INT-EXT
XP32150S	2.1GB	8MS	7200RPM	870-1024
XP34300S	4.3GB	8MS	7200RPM	1499-1724
GRAND PRIX SCSI-2 SERIES				INT-EXT
GP34301S	4.3GB	8.6MS	7200RPM	1099-1224
GRAND PRIX SCSI-2 SERIES				INT-EXT
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ST15150W	4.29GB	8MS	3.5"	1619

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MC3243W	4.30GB	8.5MS	3.5	1459
MC1991W	9.10GB	10MS	FH	2259
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MC4221WAV	2.05GB	8.5MS	LP3.5	$1120
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MC1991WAV	9.10GB	10MS	FH	2369

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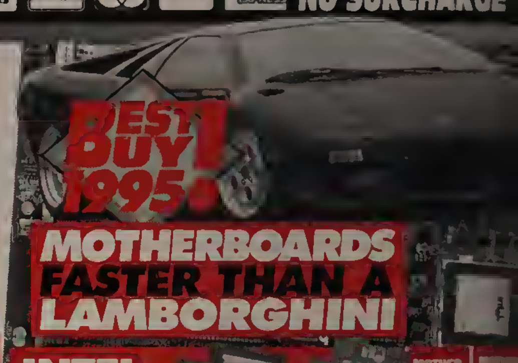

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1MB X 9-70NS SIPP	50
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CONNER
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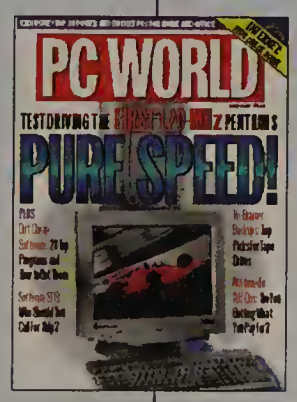

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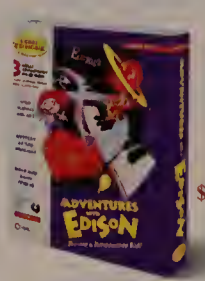

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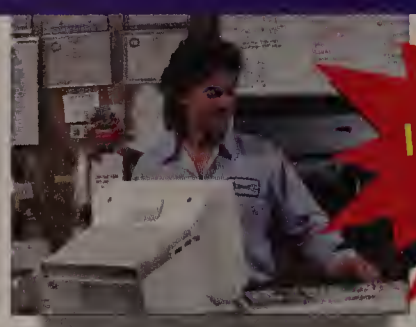

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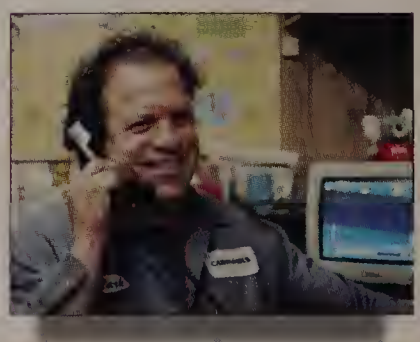

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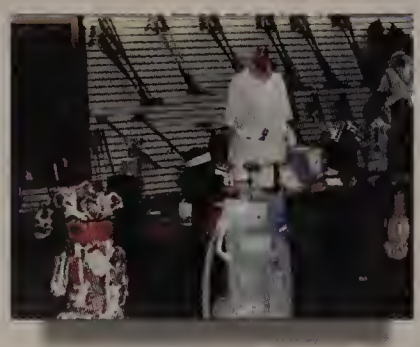

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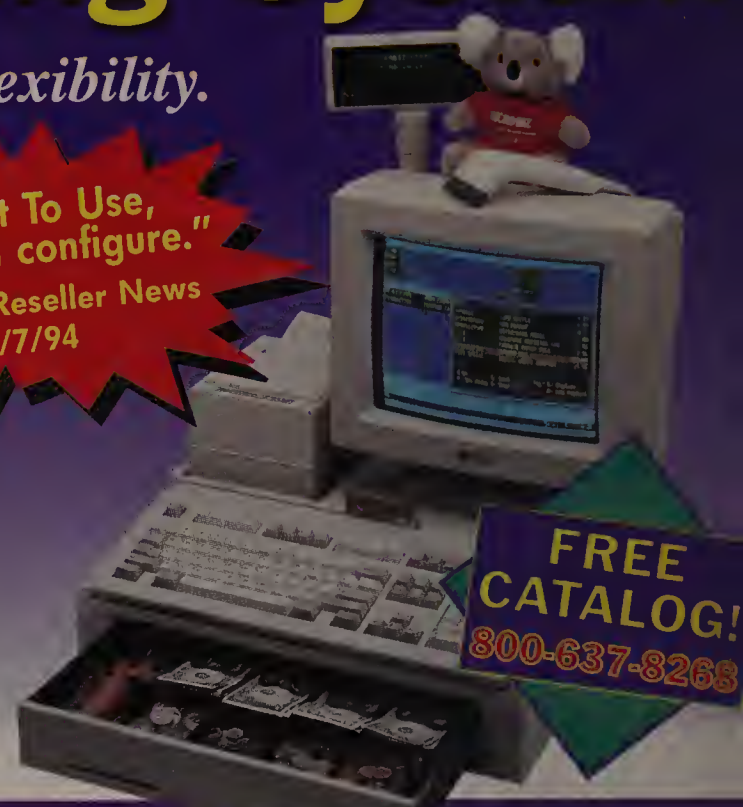

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Pull-down menus and point-and-select windows. Scan the bar code label, key in the transaction and produce detailed receipts. Products sold are automatically deducted from inventory.

➤ Easier Business Management

Create purchase orders. Detailed customer history reports to show purchases and amounts. Set up price levels and discount rates. Create balance due reports and account statements.

➤ Reduce Costs

Reduce your inventory up to 30% by computerizing. Get an out of stock warning at time of sale. Track multiple vendors for each product - have the ability to select the low cost vendor for that product.

➤ Added Features:

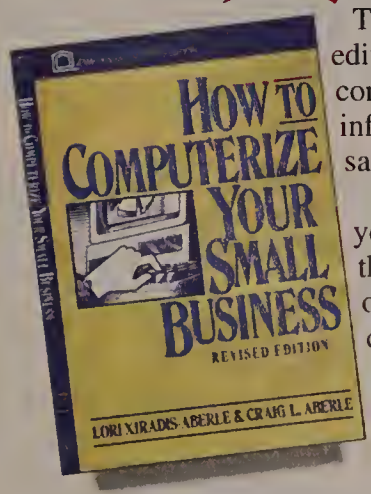
- Multi-user and multi-site versions
- Backorder tracking
- Merges with major accounting packages
- Automatic credit card verification and UPS shipping module (optional)
- Prints bar codes
- Multiple currency, vendors, ship to addresses and printers
- International version available
- Assign serial numbers to inventory for accurate tracking

➤ Demo version available

➤ Open Data (We use dbase type files so you can creatively use your own data)

How to Computerize Your Business

Includes FREE software for running your business!



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Circle 166 on reader service card

THE BEST ACCOUNTING PROGRAM

JUST GOT BETTER.

ACTPlus Version 10.0

Over fifty new features in ACTPlus version 10.0

- Two due dates in Accounts Payable: discount date and invoice due date!
- Allow change on-the-fly!
- Accounts Receivable integrates deposits to Check Reconciliation!
- Bank-to-bank transfer transactions in Check Reconciliation!
- 1995 tax table update!
- Automatic Inventory import option!
- Allows 18 months before closing previous year!
- Global price and last cost update. Ranges by stock number, vendor,

AND MUCH, MUCH MORE!

Job Cost Module

Performs job costing for estimating, work-in-progress, phases, overhead, and subcontracting. Integrates fully with ACTPlus!

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ACTrain Video
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Special Savings!
Special savings when you purchase ACTPlus with CMS Data Query module as a single unit. Reg. $499.00
Special price: $449.50
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GENERAL LEDGER

- User-defined numbering of accounts with up to 15 alphanumerics.
- Allows multiple departments.
- Allows transaction posting to prior or future financial periods.
- Comprehensive financial reports.
- G/L Report Writer with which user can design up to 250 financial reports.
- On-screen running debit and credit totals during transaction entry.
- Recurring journal entries.
- Automatic posting to appropriate ledger accounts from all integrated modules, therefore financial reports are current.
- Complete posting audit trail.

ACCOUNTS RECEIVABLE

- Allows recurring transactions.
- Payments can apply to up to 250 invoices.
- New customers can be added during transaction entry.
- Customer file shows credit limit, collection status, finance charge, YTD charges, and YTD payments.
- Reports can be sorted by: customer number, customer name, customer type, zip code, salesperson code, or biller code.
- Lookup by name, customer number, or phone number.
- Up to 15 alphanumeric characters for customer numbers.
- Handles cash receipts and partial payments.
- Five user-defined aging periods.
- Provides aged reports by payment date.

ACCOUNTS PAYABLE

- Cash flow analysis/forecast.
- Allows immediate checks (handwritten or printed).
- Prints checks and 1099 miscellaneous.
- Computes early payment discounts and records discounts taken.
- Checks for duplicate transactions.
- Automatically prepares payment transactions from the Cash Requirements Report. The user may change, add, or delete any or all of these transactions.
- Easy entry of recurring expenses for transactions.
- Add new vendors and new inventory items on-the-fly during invoice processing.
- Default General Ledger expense account for vendor.

ORDER ENTRY

- Allows real-time update of inventory.
- Allows recurring invoices.
- Allows adding stock items and customers on-the-fly.
- Invoice for sales and/or service (allows billing for non-stock, special order items).
- Complete detail sales reports with user-defined sorts.
- Add customers and stock items on-the-fly during invoice entry.
- Allows customer credit limits and alerts when limits are exceeded.
- Allows for cost of non-inventory and special orders.
- User-defined tax sales rates.
- Displays customer balance during invoicing.
- Prints nested comment blocks on invoices for warranties, sales remarks, messages, policies, etc.
- Reprint posted Order Entry invoices from history.
- Able to flag an invoice for "hold" until ready to post (quotes on unfilled orders).
- Automatically generates invoice numbers, or allows user-assigned invoice numbers.
- Maintains sales history information.
- Automatically updates inventory.
- Automatically posts billing information to Accounts Receivable.

PURCHASE ORDER

- Add vendors and inventory on-the-fly.
- Generates purchase orders from understock inventory items.
- Tracks multiple vendors for each stock item.
- Tracks promised date vs. actual date; quoted cost vs. actual cost.
- Lists economical order quantity.

PAYROLL

- Calculates taxes and prints checks.
- Allows user to update federal, state, and local tax tables.
- Per-diem pay, contract, piece work, hourly, and salary.
- Allows benefits and deductions on fixed amount, unit amounts, percentage of gross, or variable amount.
- 22 user-defined benefits and deductions per employee.
- Includes 1995 W-2 and 1099 forms, including the now required Federal Quarterly 941 report.
- Allows accrual payroll.
- Distributes payroll expenses to user-designated departments, including payroll for persons working in several departments at different pay rates.
- Multi-company payrolls.
- All or partial earnings, benefits, and/or deductions can be sheltered from taxes when applicable (401K, Cafeteria Plan).

CHECK RECONCILIATION

- Single or multiple bank accounts.
- Sort by voided, stop-payment, deposit sources.
- Allows reconciliation either from checkbook or bank statement.
- Sorts checks by check number, date, payee, vendor, or employees.
- Processes handwritten checks.
- Accounts payable and payroll may be integrated to Check Reconciliation, and if integrated, checks from both will post to Check Reconciliation.
- Recurring transactions.
- Retains check register for 100 years.

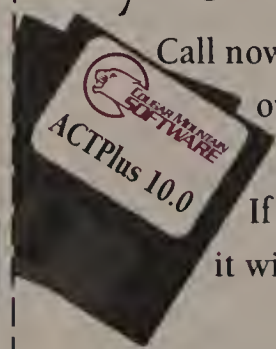
INVENTORY

- Minimum/maximum quantity levels (reorder points).
- Lookup by number or description.
- Allows quantity decimal precision up to four places.
- Provides purchase and sell conversions.
- Prints user-defined inventory labels.
- Recall inventory by an alias stock number or name.
- Delete a range of inventory stock items by user-defined parameters.
- Customer-Stock Price Window for assigning special prices for selected items to a customer.
- Promotional pricing by date.
- Five lines of inventory description.
- Pricing by customer... AND MORE!
- Stock numbers of up to 15 alphanumeric characters.
- Valuation of inventories by LIFO, FIFO, weighted average, or standard cost.
- Five quantity break price levels on each stock item or price level pricing.

LYNX (ASCII File Converter)

- Allows importing and exporting of data

Try ACTPlus version 10.0 for 60 days!



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Circle 56 on reader service card

TECHNOLOGY UPDATE

New device turns any electrical outlet into a phone jack

Engineering breakthrough gives you unlimited phone extensions without wires or expensive installation fees

By Charles Anton

You don't have to have a teenager to appreciate having extra phone jacks. Almost everyone wishes they had more phone jacks around the house.

When I decided to put an office in my home, I called the phone company to find out how much it would cost to add extra phone jacks. Would you believe it was $158?

No more excuses. Today, there are a thousand reasons to get an extra phone jack and a thousand excuses not to get one. Now an engineering breakthrough allows you to add a jack anywhere you have an electrical outlet. Without the hassle. Without the expense. And without the miles of wires.

Like plugging in an appliance. Now you can add extensions with a remarkable new device called the Wireless Phone Jack. It allows you to convert your phone signal into an FM signal and then broadcast it over your home's existing electrical wiring.

Just plug the transmitter into a phone jack and an electrical outlet. You can then insert a receiver into any outlet anywhere in your house. You'll be able to move your phone to rooms or areas that have never had jacks before.

Clear reception at any distance. The Wireless Phone Jack uses your home's existing electrical wiring to transmit signals. This gives you sound quality that far exceeds cordless phones. It even exceeds the quality of previous devices. In fact, the Wireless Phone Jack has ten times the power of its predecessor.

Your range extends as far as you have electrical outlets: five feet or five hundred feet. If you have an outlet, you can turn it into a phone jack—no matter how far away it is. The Wireless Phone Jack's advanced companding noise reduction features guarantee you crystal-clear reception throughout even the largest home.

Privacy guarantee. You can use The Wireless Phone Jack in any electrical outlet in or around your home, even if it's on a different circuit than the transmitter. Each Wireless Phone Jack uses one of 65,000 different security codes. You can be assured that only your receiver will be able to pick up transmissions from your transmitter.

Is the Wireless Phone Jack right for you?

The Wireless Phone Jack works with any single-line phone device. Almost anyone could use it, especially if...

- **Few jacks.** *You want more phone extensions without the hassle and expense of calling the phone company.*
- **Bad location.** *You have jacks, but not where you need them most, like in the kitchen, garage, home office or outside on the deck.*
- **Renting.** *You want to add extensions, but you don't want to pay each time you move.*
- **Other phone devices.** *You have an answering machine, modem or fax machine you want to move to a more convenient place.*

The Wireless Phone Jack System consists of a transmitter (right) and a receiver (left). One transmitter will operate an unlimited number of receivers.

Unlimited extensions—no monthly charge. Most phone lines can only handle up to five extensions with regular phone jacks. Not with the Wireless Phone Jack. All you need is one transmitter, and you can add as many receivers as you want. Six, ten, there's no limit. And with the Wireless Phone Jack, you'll never get a monthly charge for the extra receivers.

Works with any phone device. This breakthrough technology will fulfill all of your single-line phone needs. It has a special digital interface for use with your fax machine or modem. You can even use it with your answering machine just by plugging it into the Wireless Phone Jack receiver.

The Wireless Phone Jack lets you add a phone, modem, fax machine or answering machine almost anywhere.

Special factory-direct offer. To introduce this new technology, we are offering a special factory-direct package. For a limited time, the transmitter is only $49. One transmitter works an unlimited number of receivers priced at $49 for the first one and $39 for each additional receiver. Plus, with any Wireless Phone Jack purchase, we'll throw in a phone card with 30 minutes of long distance (a $30 value) for only $9.95!

Try it risk-free. The Wireless Phone Jack is backed by Comtrad's exclusive 30-day risk-free home trial. If you're not completely satisfied, return it for a full "No Questions Asked" refund. It is also backed by a one-year manufacturer's limited warranty. Most orders are processed within 72 hours and shipped UPS.

Wireless Phone Jack transmitter ...$49 $4 S&H
Wireless Phone Jack receiver .....$49 $4 S&H
save $10 on each additional receiver—$39

30-minute long distance phone card.....~~$30~~
$9.95 with Wireless Phone Jack purchase

Please mention promotional code **017-PJ-6400.**

For fastest service, call toll-free 24 hours day

800-992-2966

To order by mail, send check or money order for the total amount including S&H (VA residents add 4.5% sales tax). Or charge it to your credit card by enclosing your account number and expiration date.

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Advertised Products

951 Desktop computers
952 Notebook computers
953 Windows 95 software
954 Monitors and video boards
955 Accounting software
956 Graphics software
957 Network/sharing products
958 Printers
959 Multimedia products
960 Utilities
961 Mail order companies
962 Storage devices

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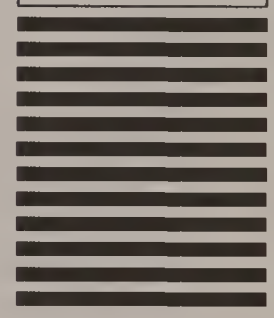

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SMART COMPUTING for kids

From the Editors of Child and PC World

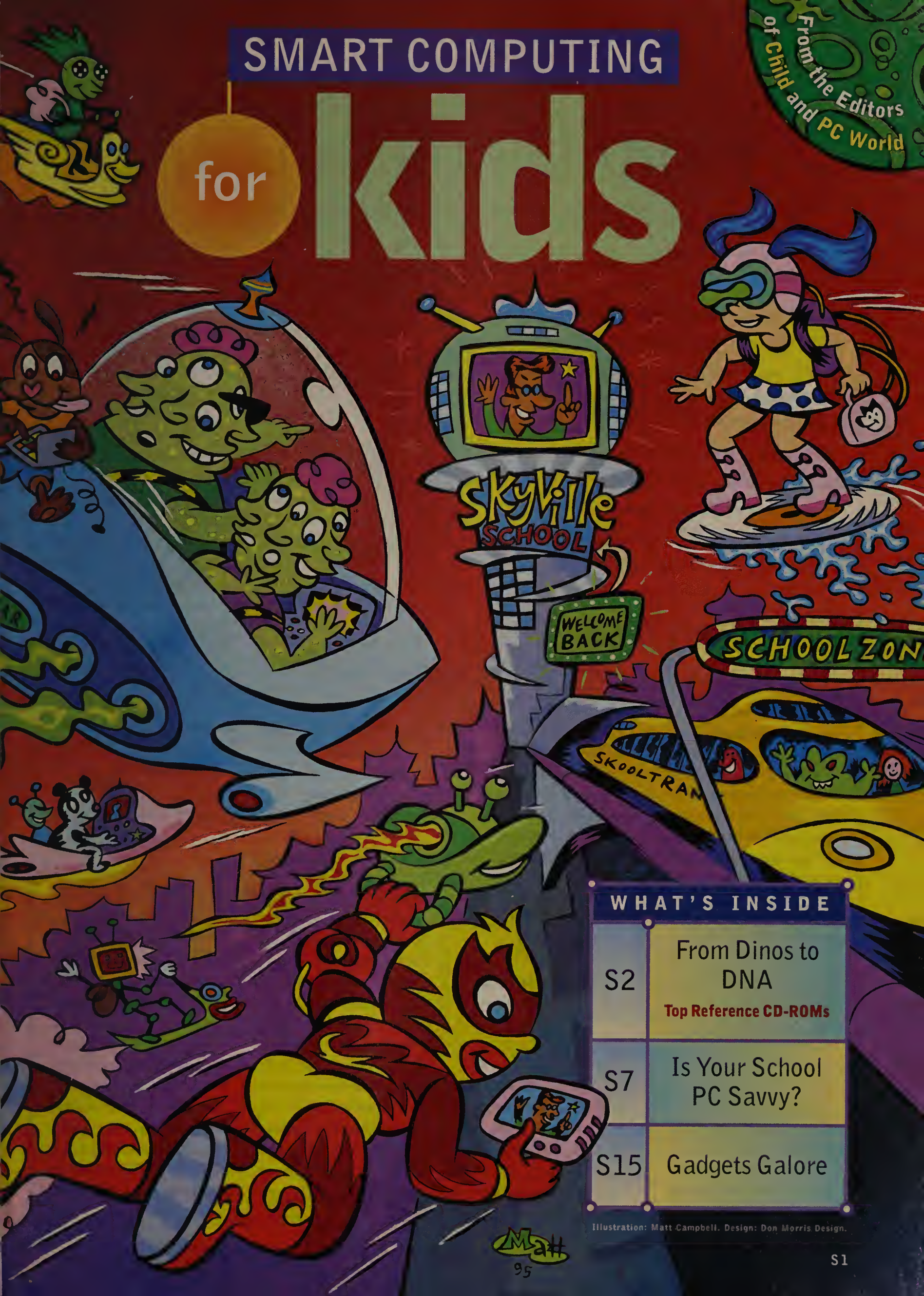

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Illustration: Matt Campbell. Design: Don Morris Design.

From Dinos to DNA

The Top Reference CDs for Kids

NEW CD-ROMS PUMP SO MUCH ENERGY INTO LEARNING materials that they can make everything from simple word definitions to the solar system come alive—and completely captivate children of all ages. So before you invest in a traditional 26-volume encyclopedia set, check out our top picks for CDs your kids will love now and will refer to time and again in the years to come.

Dictionary Encyclopedia Science The Body Nature

Ages 3 to 6

3-D Dinosaur Adventure

STARTING WITH A THREE-DIMENSIONAL T-Rex snarling right out of your monitor (if you don your red and green paper 3-D glasses in time), this program will grab and keep your kid's attention as he explores the 3-D Dinosaur Park. Parents will enjoy reading aloud the fascinating stats on favorite dinos (which older kids can use for reference). Kids can then use their new knowledge to play several engaging games. Setting a new standard for pizzazz in both presentation and content, this program is sure to be a hit at your house. Knowledge Adventure (800) 542-4240; MS-DOS or Windows, $35.

Let's Explore The Farm

Let's Explore The Farm

IT'S THE STUFF THAT A PRESCHOOLER'S dreams are made of—getting free run of a farm, with no one to tell you not to pet the pigs. And in this ultimate guide to farm animals (complete with spoken labels and lots of fun facts), there's a pond full of fish and quacking ducks, a chicken coop, a lively barn, and much more for curious children to explore. Kids will also want to play one of the five new games in this version, including a challenging scavenger hunt. Humongous Entertainment (800) 499-8386; Windows, $29.95.

My First Incredible, Amazing Dictionary

ONE THOUSAND WORDS burst into action in this captivating beginner dictionary that makes it easy for kids to learn new words. Clicking on a fire engine, for example, will give your child a short, spoken definition and a short video clip. Then guess-the-missing-letter games encourage kids to practice their emerging reading and spelling skills. While more words would have increased this program's value, its lively, kid-friendly presentation will make it a worthy addition to your library. DK Multimedia (800) 356-6575; Windows, $39.95.

My First Incredible, Amazing Dictionary

The Multimedia Bug Book

FIFTY BUGS HAVE ESCAPED from the collection of professor Anson Pantz! But budding entomologists of all ages get to come to the rescue on this CD, which contains everything a kid could want to know about insects. Armed with clues, kids can search one of five environments and use a net-shaped cursor to grab the correct creepy crawler. Success is rewarded with a video of a live, wriggling insect, along with fascinating facts. Older kids can also perform experiments to learn about bug behavior. Note: Preschoolers may need help navigating the CD's complex design. Swfte International (800) 237-9383; Macintosh and Windows, $49.95.

By Warren Buckleitner and Ellen Wolock

For more information about all the products in this article, circle reader service number 901.

Illustration: Philip Anderson. Icons: Natasha Lessnik.

lands, and so on. Once they arrive, they can explore the fauna and flora, accessing eye-popping pictures and tantalizing bits of information on 200 nature topics. More fun awaits in the scavenger hunt mode, in which kids must search for the correct answers to questions such as "When is an avalanche most dangerous?" Microsoft Corp. (800) 426-9400; Windows, $34.95.

The 1995 Guinness Multimedia Disc of Records

THE SWIFTEST, SMALLEST, biggest—it's all here, in this collection of nearly 15,000 world records. For example, type in "strawberry" to quickly find the records for the biggest strawberry ever grown (8.17 ounces) and the largest strawberry shortcake (measuring 45 feet by 8 feet). Or kids can simply flip through one record at a time, amusing and amazing themselves with such entries as that of a man who took a 29-foot dive into just 12 inches of water and lived—with footage of the plunge right there on the screen to prove it! Grolier Electronic Publishing, Inc. (800) 285-4534; Macintosh and Windows, $49.95.

Ages 7 to 9

Merriam-Webster's Dictionary for Kids

HERE'S A CHILD-FRIENDLY dictionary with the power of 20,000 words. Just type in a word (or a close approximation) and this program instantly gives the correct spelling, looks up the meaning, illustrates it with a picture or animation—even pronounces it out loud. Then when they're done with their homework, kids can tease their brains with five addictive multilevel word games that are worth the price of this disk alone. Mindscape (800) 234-3088; Windows, $40.

Microsoft Explorapedia: The World of Nature

IF YOUR KIDS ARE crazy for animals, this CD will let them get up close and personal with all kinds of critters. Children begin by clicking on the controls of a wacky spaceship cockpit to fly to a rain forest, grasslands, wet-

Merriam-Webster's Dictionary for Kids

What's the best way to share a childhood memory with your child?

Think. Think. Think.

With Disney's animated storybook "Winnie the Pooh and the Honey Tree" on CD-ROM, your child can experience Pooh in a new and special way. Through interactive technology, they can immerse themselves in the Hundred Acre Wood as they bring this classic story to life. Not only can they listen to the story, read along and explore each page at their own pace, but they can actually interact with lovable Pooh and his gang. Sing-Alongs and exciting skill-building games allow your child to have hours of fun playing with the classic cast of characters. Dozens of surprise animations add to the experience. And your child can even learn word recognition and vocabulary with an "action dictionary". What could be better than that?

Disney INTERACTIVE

Compatability with Windows, Windows 95, and Macintosh

© Disney

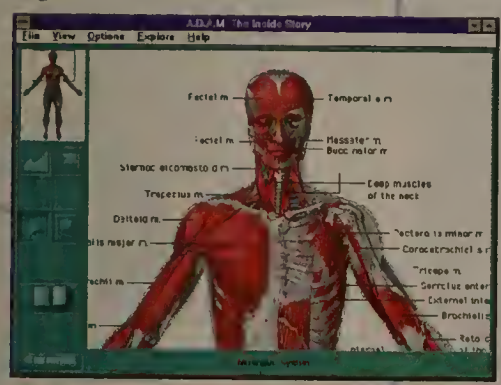
The Random House Kids' Encyclopedia

DID YOU KNOW THAT THE FIRST Thanksgiving meal was actually a breakfast? This is just one of the many facts that can be discovered in this lighthearted kids' encyclopedia. Using a mouse, children can access information by clicking on buildings in a surrealistic town. In the Word Factory, your child can use an alphabetical index or type in a key word to find information. Next door is the Movie Theatre, which is chock-full of historical videos. And finally (and the most fun), there's The Arcade, in which kids can complete mazes, solve riddles, or play a high-tech Hangman game. Knowledge Adventure (800) 542-4240; Windows, $45.

Ages 10 and Over

A.D.A.M. The Inside Story

IMAGINE WHAT WONDERS YOU would discover if you were able to see right through your skin. Well, with A.D.A.M., which stands for the Animated Dissection of Anatomy for Medicine, skin does become see-through. Starting with the naked body of Adam or Eve (don't worry, you can conceal certain details with strategically placed fig leaves), kids can uncover one layer at a time, right down to the bones.



A.D.A.M. The Inside Story

The illustrations, designed for medical texts, and the 46 videos of body systems are excellent references for biology class reports—and are just plain fun to explore. There is also a medical dictionary with humorous explanations, such as how the Heimlich maneuver once saved Adam from choking. A.D.A.M. Software, Inc. (800) 408-2326; Windows and Macintosh, $39.95.

Eyewitness Encyclopedia of Science

HERE'S A PROGRAM THAT WILL transform your kid's computer into a science museum, with more than 1,700 multimedia exhibits that illustrate—and enliven—chemistry, math, physics, and the life sciences. The simple design makes it easy for kids to browse or to do research. And narrated videos and clear, concise articles help explain even complex scientific mysteries. DK Multimedia (800) 225-3362; Windows and Macintosh, $79.95.

From Dinos to DNA

Microsoft Dogs

BET YOU DIDN'T KNOW THAT the Old English sheepdog isn't English (or necessarily old) at all. That's just one of the fun facts kids can discover about their canine pals in this entertaining and educational program. Using a cursor shaped like a paw (what else?) and a menu made up of giant dog biscuits, children can explore the world of dogs to learn more about the care, origins, personality, and behavior of their favorite breeds. Or kids can tour the program with the help of one of four guides, such as Desdemona, the Dog Talent Agent, who helps children understand each dog's special abilities. Best of all: the gorgeous photography and the abundance of amazing hound footage—of a dog trained to aid quadriplegics, dogs who do arithmetic, or a man who manages to walk 12 dogs at once, to name a few. There's even a video of a parachuting pooch. Microsoft Corp. (800) 426-9400; Windows, $39.95. ●

Warren Buckleitner is editor of Children's Software Revue, *to which Ellen Wolock is a frequent contributor. Together, these former preschool teachers are the parents of Sarah, 4, and Jenna, 7 months.*

Our Favorite Encyclopedia

Microsoft Encarta 96

With innovations such as the Find Wizard (a tool that helps you narrow down your choices), getting detailed information on just about anything is easier and more fun than ever before with this encyclopedia. A menu at the top of the screen provides easy access to the contents, which include a time line from 15 million B.C. to the present, a gallery of 8,000 pictures and film clips, an atlas with 798 maps, and a browser that lets you flip through the encyclopedia one page at a time. There are many surprises: Using the time line, you can check out when ice cream was invented (in China around 2,000 B.C.), and if you're wondering what the national anthem of Bolivia sounds like, all you have to do is click the mouse to hear it. While it may not be as comprehensive as traditional encyclopedia sets, Encarta can be a lot more efficient—and far more fun. Microsoft Corp. (800) 426-9400; Windows and Macintosh, $99.

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Is Your School PC Savvy?

It's not how many computers your kid's school has—it's how they're being used that counts • by Leslie Crawford

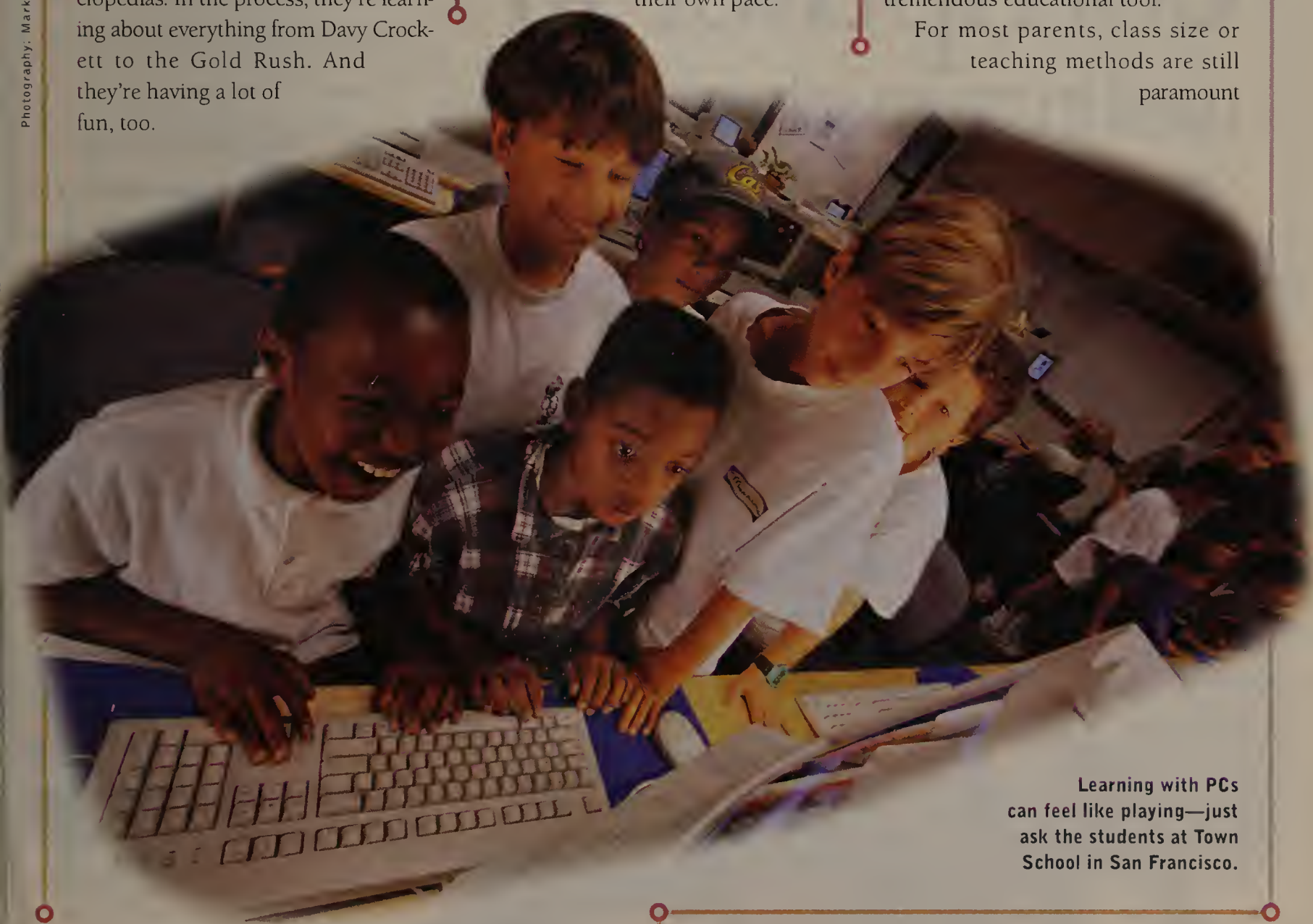
CALL IT A SMALL MIRACLE. THE FIFTH-graders at Garden Gate Elementary School in Cupertino, California, have been coming in early from recess and staying at school long after the final bell. Why? So they can work in the computer lab, putting the finishing touches on social studies projects.

With their teacher's help, the students are preparing multimedia reports—complete with original artwork, writing, and sound effects—on the topic "Traveling to California." Working in pairs, they are using both traditional reference books and CD-ROM encyclopedias. In the process, they're learning about everything from Davy Crockett to the Gold Rush. And they're having a lot of fun, too.

In this and classrooms like it throughout the country, children are using multimedia computers to supplement traditional textbooks and make learning more engaging than ever before. And all students—whether they're struggling with their studies or breezing through them—are finding that with the help of the right software packages, they can learn and explore at their own pace.

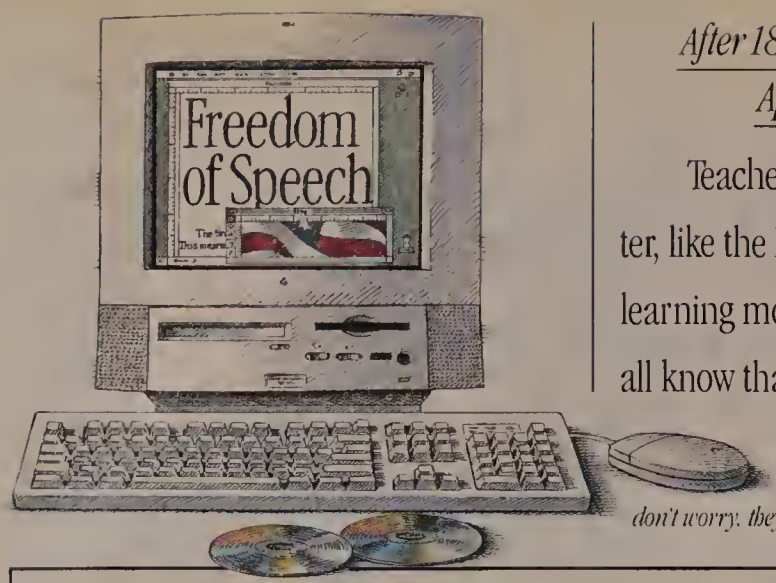
That's why parents and educators are working together to better integrate the use of computers and on-line services into regular classroom activities. "The best reason to bring computers into the school is not to teach children how to use computers," says Emery Roth, a computer facilitator in Connecticut's Region 12 school district. "It's because computers are such a tremendous educational tool."

For most parents, class size or teaching methods are still paramount



Learning with PCs can feel like playing—just ask the students at Town School in San Francisco.

Photography: Mark Richards



Put in the CD-ROM, and your kids are off to Patagonia, the Arctic, even deep space. But don't worry, they'll be back in time for dinner.

After 18 years in the classroom, Apple's learned a lot.

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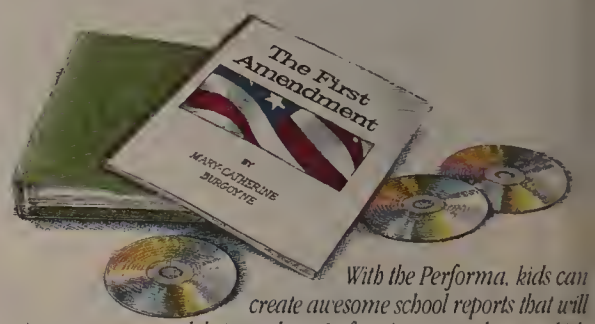
Which computer is used in more schools than any other? Anyone? Anyone?



With the Performa, kids can create awesome school reports that will impress you — and their teachers. In fact, it may make your kids look almost as smart as you keep telling everyone they are.

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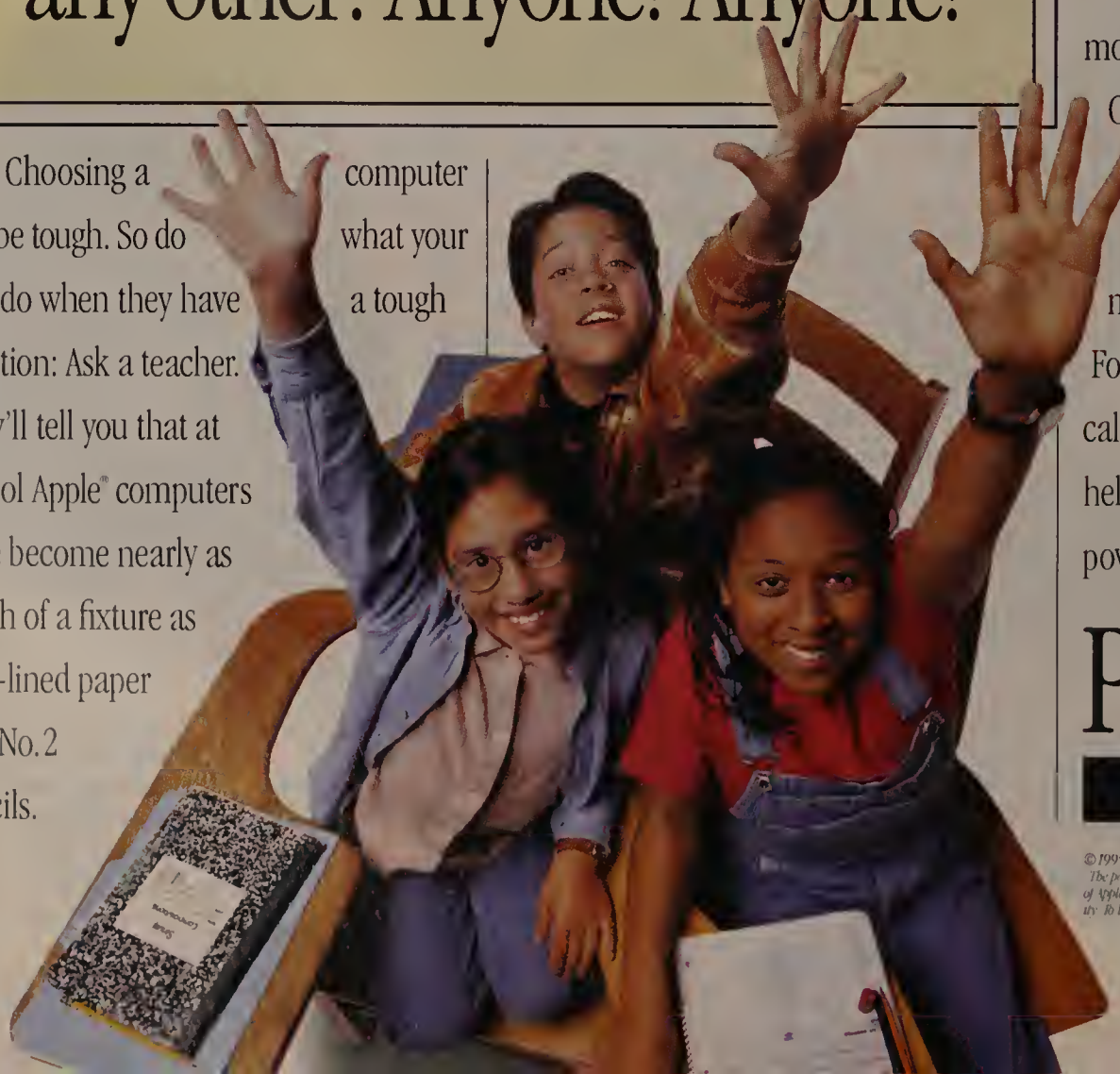

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when evaluating schools. But parents are increasingly recognizing the importance of computers in schools and assessing how well teachers are using the latest technology to augment traditional classroom learning.

Beyond the Basics

DEBBIE HANSEN OF SAN LORENZO, CALIfornia, wants to make sure that her three children, ages 3, 5, and 7, don't miss out on technologies that can enrich their education. Currently, their school makes limited use of computers, focusing primarily on drill-and-practice programs, rather than on using on-line services or educational CD-ROMs. So Hansen is working to form a technology committee that will educate teachers and parents about how computers can be more fully integrated into the school curriculum. One of her first goals is to raise enough funds to buy modems and get the school hooked up to the Internet, which she deems "an invaluable tool for students."

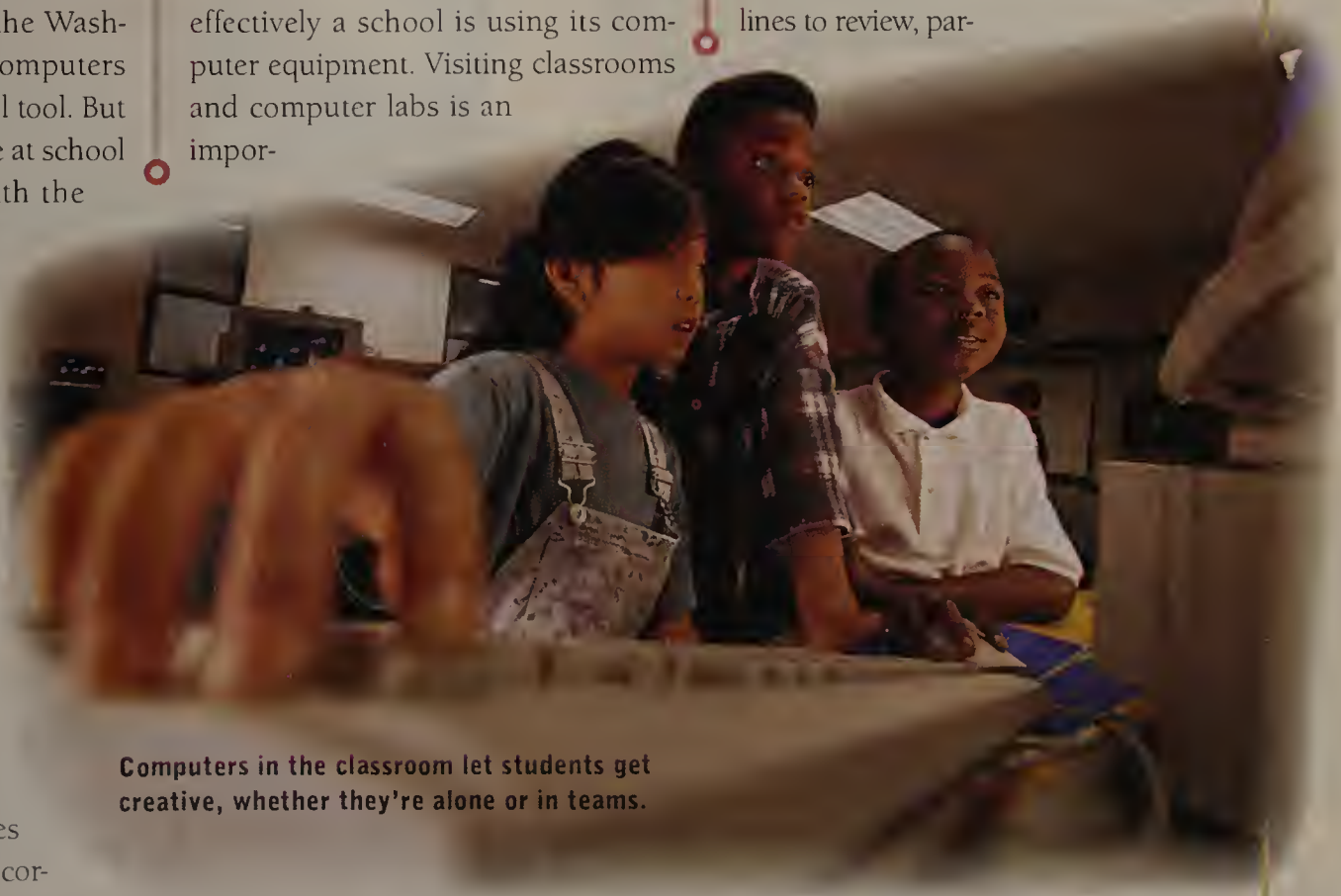
While most parents agree with Hansen about the importance of computers in their children's education, not all are as concerned as she is. William Stuckey, a dad in the Washington, DC area, believes computers are an important educational tool. But he's concerned that their use at school might actually interfere with the way his son Chris learns. "You don't want children to lose the basic concepts," says Stuckey. "You have to introduce the tool at the right time. When that is, however, I don't know."

The sooner kids use computers, the better, says Dave Moursund, Ph.D., executive officer of the International Society for Technology In Education. "It takes a long time to learn to use technology, just as it takes time to learn to hold a pencil correctly and write. Computers are now part of the basics." Although experts say that there's no "perfect" age for kids to start using a computer, many schools are introducing computers as early as kindergarten, so children can learn basic keyboarding skills.

Limited to the Lab?

IT'S NOT ALWAYS EASY TO EVALUATE HOW effectively a school is using its computer equipment. Visiting classrooms and computer labs is an important first step, but in many schools, computer use can vary considerably from one class to the next—particularly if there's no technology plan in place. In one room, for example, students may be creating their own multimedia family histories, while right next door children may get the chance to use a PC only during a short lab time.

If there are no formal guidelines to review, par-



Computers in the classroom let students get creative, whether they're alone or in teams.

QUIZ: How Does Your School's Computer Program Rate?

Answer each of the following questions, and then total up your score to see how computer savvy your child's school is.

1. Does your school or school district have a technology plan? YES ○ NO ○

2. Are there computers in classrooms as well as in the lab? YES ○ NO ○

3. Do at least some of the computers have CD-ROM drives? YES ○ NO ○

4. Does the school sponsor technology nights for students? YES ○ NO ○

5. Do students have access to an on-line service? YES ○ NO ○

6. Does the school district require that new textbooks also have a software component? YES ○ NO ○

Bonus points

7. Are loaner computers available to students for home use? YES ○ NO ○

8. Does your school have an Internet home page? YES ○ NO ○

9. Are computers in classrooms linked to those in the lab? YES ○ NO ○

10. Are your school's computers linked to the computers of other schools in the district? YES ○ NO ○

Scoring

Each "Yes" is worth 5 points. "No" is worth 0 points. Bonus questions are worth 10 points each. If you scored 50 to 70 points, your school is ready for the 21st century; 30 to 50 points, you're on the right technological track; less than 30 points, it's time for you to roll up your sleeves and get to work.

Illustrations: Matt Campbell.

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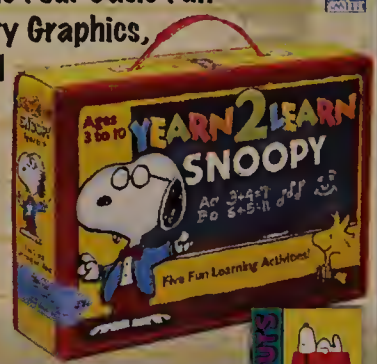

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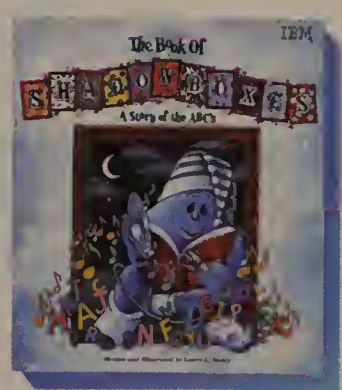

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Is Your School PC Savvy?

ents often wind up evaluating a computer program based primarily on how many PCs a school owns. But it's not that simple. "The most important question parents can ask is, 'How are computers being used to support my child's learning?'" says Linda Roberts, director of the Office of Educational Technology in the U.S. Department of Education in Washington, DC. Other factors to consider: Is the school using CD-ROMs to supplement traditional classroom materials? Do kids have access to on-line services and the Internet? Do textbooks have a software component?

Computers are becoming more common in the classroom, but most schools still keep most of the equipment in a lab, which classes might get to visit just once a week. Although this is often the only way to ensure that all students get the chance to use the equipment, it can mean that computer work is unrelated to class work. There are ways to bridge the gap, however, including putting computers on rolling carts so that they can be wheeled into classrooms for special projects. A classroom computer can also be linked to those in the lab or library via a local area network.

Experts say parents should ask schools: "How are computers being used to support my child's learning?"

Becoming a Techie

TAKING ADVANTAGE OF COMPUTER TECHnology will require the cooperation of teachers, administrators, and parents. It won't happen overnight, and money alone won't ensure that new equipment is used wisely. Schools with a well-thought-out technology plan are already two steps ahead. But regardless of the stage your school is at, there's good news: As computer technology evolves, so does the wisdom on how it can enhance the classroom setting. Here are some ways that interested parents can get their school off to a good start this year.

Start a technology committee. This is the first step toward establishing a comprehensive plan for using computers. Make sure that parents, teachers, administrators, and possibly even older students have input.

Contact organizations that donate computers, equipment, and training personnel. Grass roots fund-raising activities like computer walks can help raise the money needed to upgrade the equipment at the school. So can lobbying for funds at the district and state level.

Volunteer to help. If you possess a lot of knowledge about computers, offer to help out in your child's classroom.

Set up a computer fair or a technology night, and invite software and hardware companies to display their latest merchandise and to give demonstrations. It's a great way for parents, teachers, and administrators to learn what's available in the educational computer market.

If you're buying a software program for home, find out if the manufacturer will also send one to your child's school. Many companies offer such incentives as a means of putting software into the hands of some of their best salespersons: teachers. ●

Leslie Crawford is a freelance writer who is based in San Francisco.

The Home PC Connection

Whether your school's computer setup is first-rate or in need of a complete overhaul, there are several things you can do at home to turn your child into a true technophile.

● **Buy a computer that's right for your family.** It doesn't have to be the same model or type that your child uses at school. Kids can adapt to all types of computers, so buy the one that best meets the needs of all your family members.

● **Send your child to after-school computer classes.** Even if you don't yet have a home computer, your child can learn all the basics and have access to the latest multimedia software. She'll also learn to be comfortable with technology.

● **Ask teachers about software.** Find out which programs your child is using at school and whether it would be useful to buy the same packages for learning at home. Many educational programs are available for both Macintosh and Windows computers, so your child may be able to use his favorite software package at home and at school—even if you don't have the same type of equipment.

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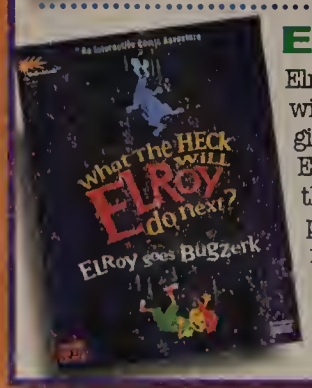

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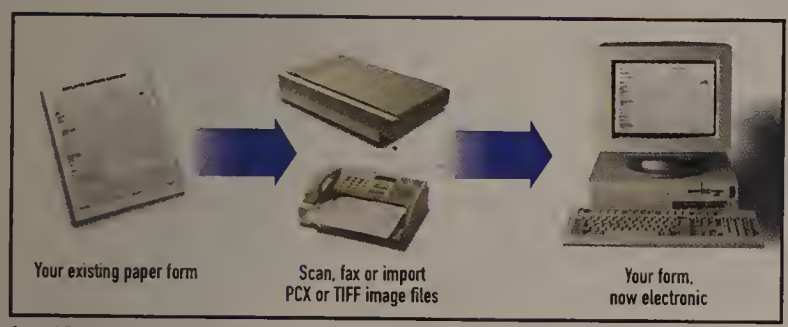

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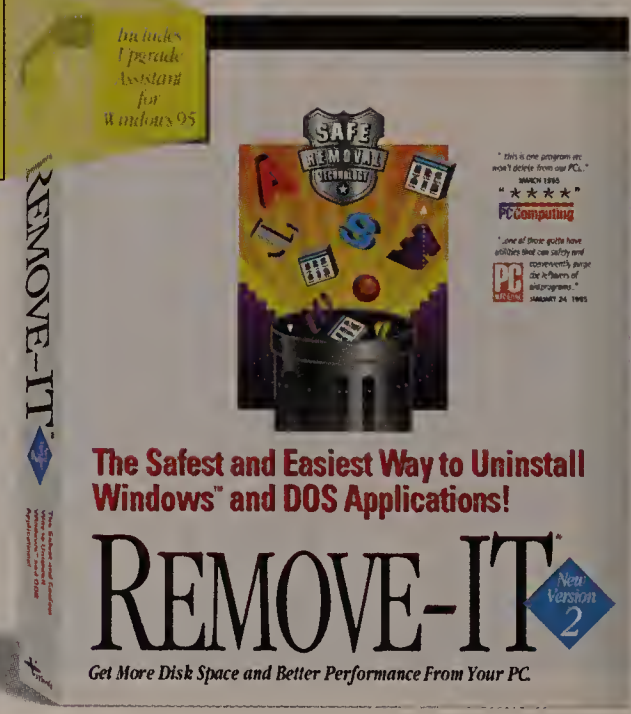
The Smart Way To Move to Windows® 95.

Includes Upgrade Assistant™ for Windows® 95



Special Windows 95 Promotional Price!
Now for a limited-time at participating resellers.

Attention Norton Desktop™ for Windows, PC Tools™ for Windows, and Dashboard® users!
Remove-IT's Upgrade Assistant is the only way to automatically configure your Windows 3.1 applications into Windows 95.

Remove-It 2 is already the safest and easiest way to clean unneeded applications and files from your PC. But it doesn't stop there. Remove-IT 2 also includes an exclusive Upgrade Assistant that ensures a near effortless move to Windows 95. The Upgrade Assistant is a personal guide that leads you step-by-step through the process of preparing your system for Windows 95. Here's how easy upgrading can be.

Pre-Installation Cleanup – The Upgrade Assistant reduces the chance of upgrade problems by carefully clearing valuable disk space to make room for Windows 95.

Windows 95 Configuration – If you decide to run both Windows 95 and Windows 3.1 until you're comfortable with the upgrade, the Upgrade Assistant will automatically configure your Windows 3.1 applications into Windows 95. Or if you use Norton Desktop, PC Tools, or Dashboard and install Windows 95 over Windows 3.1, the Upgrade Assistant will automatically transfer your Windows 3.1 program groups into Windows 95. Either way Remove-IT saves you the hassle of manually reinstalling every single application, or recreating all your program groups!

Post-Installation Cleanup – When you're ready to leave Windows 3.1 behind, the Upgrade Assistant will simply wash it away. All the unneeded remains of previous Windows installations are removed so that your PC runs at peak efficiency.

And the price for Remove-IT 2 with your "personal" Upgrade Assistant for Windows 95 is only **$39.95**. So, get smart! Ask for Remove-IT at your favorite retailer or ...

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(Ask for extension **3209**)

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"...this is one program we won't delete from our PCs..." "★★★★" PC Computing March 1995

"...one of those gotta have utilities that can safely and conveniently purge the leftovers of old programs." PC MAGAZINE January 24, 1995

"...comprehensive, intelligently designed and effective." "...helps prevent you from deleting necessary files." WINDOWS MAGAZINE February 1995

"One of Remove-IT's biggest advantages is its user interface." PC WORLD January 1995

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Illustrator: Glenn Matsui

Circle 73 on reader service card

@HOME

EDITED BY CHRISTINA WOOD

Consumer Watch

The Home PC Buyer's Bill of Rights

BY ROBERTA FURGER

Imagine how much easier our computing lives would be if PC makers and consumers could agree on some basic principles to govern the relationship between buyer and seller. Then, instead of spending hours researching customer service policies, you could focus your attention on who's got the best price or the fastest machine. Here's my list of must-haves for a home system—a Bill of Rights, if you will, for PC buyers. Few companies could satisfy every item on this list—but any firm hoping to do business in the consumer market should try.

A money-back guarantee. Whether you're buying from a retail store or direct from the manufacturer, don't buy a computer without a money-back guarantee; a 30-day guarantee is standard and gives you plenty of time to make sure everything is in working order. Warning: Stay away from companies or retailers that charge a restocking fee on returned merchandise.

A three-year warranty. Although multiple-year warranties are becoming more common, they still aren't standard. You can do your part to help banish the single-year warranty by requiring a three-year warranty on your next PC purchase.

Prompt notification of delays. When you order a product over the phone or by mail, the federal Mail-Order Rule requires that sellers give you a delivery date and notify you of delays. Although retailers aren't required to do so, they should provide the same courtesy to customers ordering custom-configured or built-to-order systems. Ask your salesperson for a delivery date—and insist on being notified of delays.

Price protection. If you buy a PC from a retail store, make sure the seller guarantees to refund the difference if you find the same unit cheaper (at the store or a different location) for up to 30 days after the sale. Mail-order buyers should demand a similar guarantee. This is by no means standard, so ask your salesperson for the company policy before you place your order. If the price of your PC drops within 30 days of its shipment, or if your model gets upgraded during that time frame, ask for a refund or upgrade.

Easy setup guides. Setting up a PC shouldn't require a degree in computer science. All home PCs should come with a quick-setup guide that walks first-timers through the process in simple terms. Color-coded cords, labeled ports, and easy-to-reach technical support all go a long way toward taking the headache out of setup. Look for these features when buying your next home computer.

Free, easily accessible technical support. In the first few weeks of ownership, you shouldn't have to pay to figure out how to get your computer up and running, or why it isn't working. And you shouldn't be left waiting on hold without the option of leaving your name and number for a technician to call you back. These tenets apply to both the hardware *and* the software that comes with your new computer. Although PC makers can't be expected to know the ins and outs of every software application they bundle, it's their responsibility to make sure the programs work with your computer and to help you with any instal-

NEAL FARRIS

lation glitches. Technical support should be available evenings and weekends—when most home users need the assistance. Make sure your PC company has a forum on a major online service for off-hours support.

Backup copies of all software. We all love preinstalled software. What's not so great is having to make backup copies of all those applications. When buying your home PC, look for one that includes backup copies of the operating system and application software. It'll save you money, storage space, and hours of time spent backing up software—or kicking yourself in the event the hard drive crashes and you realize you don't have backups.

Remote diagnostics. While not as critical as weekend technical support or a money-back guarantee, remote diagnostics software can be a great timesaver for certain kinds of hardware problems. This software allows technicians to establish a remote connection, take control of your computer, and investigate problems. Quickly identifying a problem can save you the hassle of sending your PC in for repairs or juggling your schedule so you can meet an on-site repairperson.

Searchable manuals online. This is a win-win for everyone. You'll benefit from not having to fumble through manual after manual in search of how to add memory or install a new modem. PC manufacturers save a bundle in printing costs, and, if the documentation is done right, can cut down on incoming calls to technical support. Online documentation has a nice byproduct—it saves paper and saves some trees.

Lemon replacements. It doesn't happen often, but every now and then PC manufacturers ship out lemons. If you're misfortunate enough to have bought a problem-ridden system, the manufacturer or retailer should replace the unit. No company has a formal lemon-replacement policy, however, so it may be up to you to push for the replacement. What qualifies as a lemon? There's no hard-and-fast rule, but I'd say any computer that has more than three hardware failure problems in the first six months qualifies.

Original documentation. If your new computer comes with bundled application software, check to see if the PC company includes the original documentation. Some companies edit the software literature themselves. If you're buying from a local store, ask to see the manuals. If the cover bears the name of the PC company chances are you are getting the "abridged" version.

Have something to add to this list? Send us your thoughts. It's also time to compile our annual list of customer service heroes and villains. Send your nominations to home@pcworld.com. And as always, you can contact Consumer Watch *with problems or questions. We'll investigate complaints and write about issues of broadest interest. See page 12 for contact information.*

BEFORE YOU SAY "CHARGE IT"

Think you've found the perfect home PC? Be sure to ask these questions before you sign on the dotted line.

What if I find the same computer somewhere else for less? Your salesperson should agree to refund the difference if you find the identical system priced lower within 30 days of your purchase.

Is there a toll-free line for technical support? Ask for the number, and make a few calls to it. Call at times you'll most likely be using your PC, so you know what type of hold times to expect when you need help.

Can I look at the documentation? See if the system includes a quick-start guide. Check out the software documentation, too. Some PC companies condense original documentation.

Who do I call if something breaks? If you buy retail, ask who handles repairs—the manufacturer or the store.

Feedback

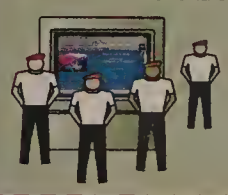
C is for Cyberspace

Do you look forward to reading a mystery the way some people anticipate eating cake? Ever find yourself breaking into spontaneous impressions of Columbo? Try a new online game from Time Warner Electronic Publishing (developed with the help of Mysterious Press). By the time you read this, you'll be able to log on to Modus Operandi as a detective (through America Online, Prodigy, or GEnie) and solve a host of murders on a mayhem-plagued digital island. You can even team up with other players...er, detectives from other online services to solve a rash of crimes. Famous mystery writers like Donald E. Westlake, Marcia Muller, and Joe Gores continually dream up more untimely deaths.

Super Service

We've gotten an influx of letters from awed Gateway customers who are impressed by the service they've been getting. A representative of Gateway told us recently that the company redesigned its technical support department and opened a new support facility in Kansas City, Kansas. It must be working. Many of the letter writers told us their calls to technical support have been answered by a technician on the first ring. Good job, Gateway!

TAKE NOTE: Cybercriminals, beware! The crime-fighting Guardian Angels will soon be patrolling the Internet. The Angels can also be contacted in their own precinct at ganetwatch@aol.com.



Price Protection

We got two letters from readers who had distinctly different experiences with price guarantees. When prices dropped two weeks after he got his PC, Quantex customer Richard Opperman discovered that the company does not offer price protection. (We forwarded his letter to Quantex and the company credited him

Cybertoys for Everyone in the House

Sassy chassis; videos on the desk; who's that dead person?

Compute in united colors with a Multigraph 447L

DOES IT MATCH THE COUCH?

It looks like something out of a Benetton ad: a hulking green construct that has no place in an office. But hey, you're at home—do what you want. This 17-inch Nokia Multigraph 447L monitor displays razor-sharp images that will have the neighbors turning colors with envy. And if your spouse is offended by the not-so-subtle chassis (mind you, it's available in red, blue, gray, and black as well), wait till you crank up the built-in speakers. Okay, at 2 watts of output they won't rock a concert hall—but they'll at least save you some desk space. And while the garish design may be a gimmick, the battery of display controls and the Energy Star power-down capability are serious business. Surprisingly, the 447L delivers a subdued image along with a stable 75-Hz refresh rate at 1024 by 768 resolution that make the monitor well suited for long hours of work—and play. —*Michael Desmond*

- **Nokia Multigraph 447L** $699; Nokia Display Products; 800/296-6542. Grade: B

Reader service no. 741

CENSORED FILMS

At $19.99, this is the cheapest CD-ROM movie guide yet. Blockbuster Video Guide to Movies & Videos has some nice features, including "tours" of major film genres and an option for modem-based updates. But the filmographies are hard to find, and it gives credits only for director and stars. Worse, it's missing a lot of movies. Blockbuster's corporate policies, which ban movies rated X or NC-17, keep important films like *In the Realm of the Senses* off the CD entirely, and give inaccurate information about movies like *The Bad Lieutenant*, for which both R-rated and less-abridged versions are available. If you rent frequently from Blockbuster, this disc could help you find a rental. Otherwise, shell out the extra cash for Cinemania or Corel's All-Movie Guide. —*Lincoln Spector*

- **Blockbuster Video Guide to Movies & Videos** $19.99; Creative Multimedia; 800/262-7668, 503/241-4351, 408/644-2007 (fax). Grade: C-

Reader service no. 742

HISTORY IN THE MAKING

Conservative foes of multiculturalism might not like the liberal view taken in Compton's Encyclopedia of American History. Then again, leftists won't find radical critiques of the ideologies and events that have shaped U.S. society. But students will be turning out state-of-the-art reports from this rich resource. Based on Columbia University historian Alan Brinkley's *American History: A Survey*, the content does not venture far from "objective" textbook fare. Some ex-

FEEDBACK CONTINUED

for the difference anyway.) Before placing an order with Micron, Peter Ho of Rockville, Maryland, asked if the company offered a price protection plan. He listened skeptically to Micron's claim that if the price dropped within four weeks of receiving the computer, Ho would get a rebate, provided he requested a refund. The prices dropped, he made the request, and he got the refund.

Digital Individualist

You can actually download Todd Rundgren's new album, *The Individualist*, on CompuServe. With a slow modem, it'll take about seven hours—but hey, it'll save you a trip to the record store. Afterwards, you can spend seven hours trying to figure out how to listen to the thing in your car. Rundgren has his own forum on CompuServe (go individualist) where you can listen to samples from his record and maybe even chat with the individual himself.

TAKE NOTE: Home education title sales jumped 88.2 percent in 1994. Sales of word processing programs were feeble by comparison (0.3 percent increase).

Source: Software Publishers Association

Cyber Field Trips

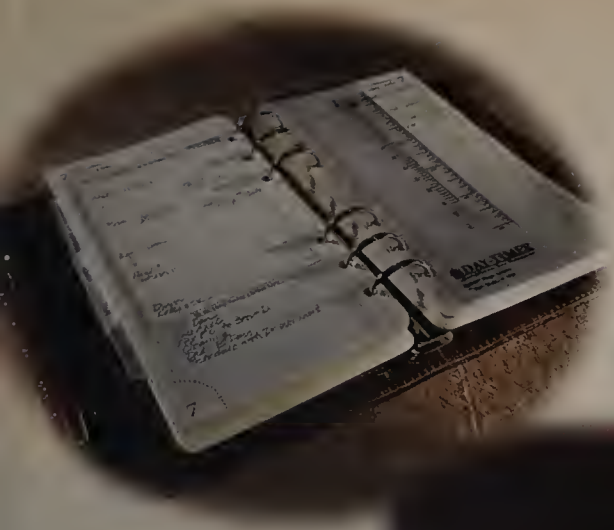
Now you can take a field trip without those annoying bus fumes. Just fill out a form on America Online (keyword roadtrip) that details the online tour you're planning. Then have your group gather in a predetermined chat room, and off you go. All members of your group will be able to chat while you tour. This could be a handy way to show distant relatives around America Online.

No Time to Work

A recent study by Coleman & Associates may help explain why you can't get all your work done: games. Of 1003 people surveyed, 25 percent admitted that the last time they had played a computer game was at work. Mid-level managers were either the most likely to be gaming or else the most honest about their habit.

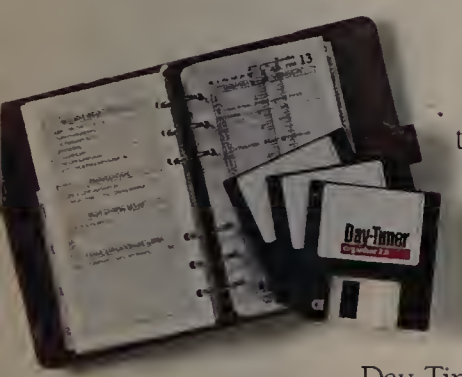
By Christina Wood

PHOTO: ROBERT CARDIN; ICONS: JOHN HERSEY; ILLUSTRATION: CHIP WASS



If You Can't Live Without This,

This Is To Die For.



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With a single, integrated system that fuses the power of the computer with the portability of the paper planner.

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To get a Windows® or Mac version — at a new low price of just $59.95* — just see your software retailer, or contact one of the phone numbers or addresses below.

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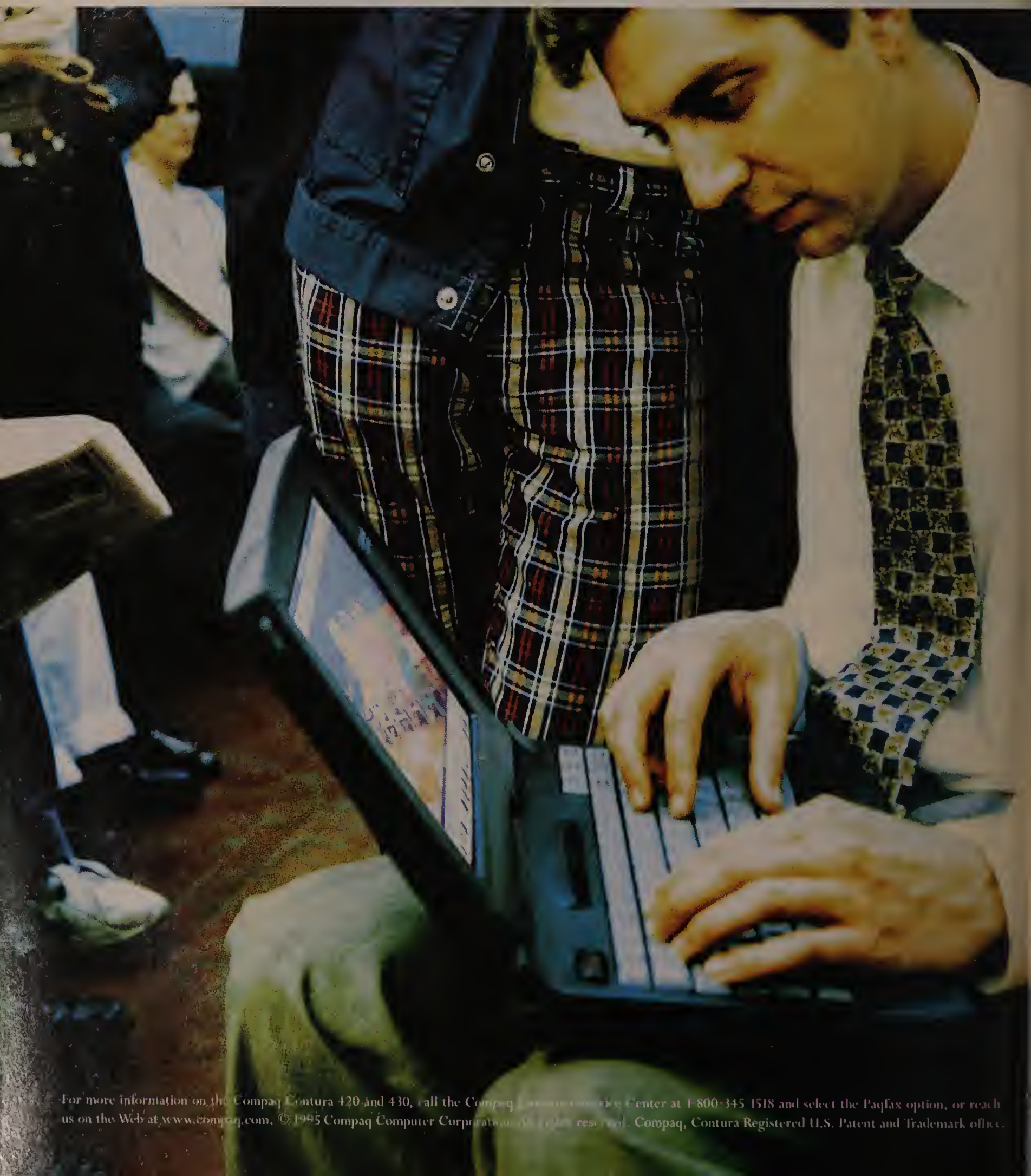
*Average retail sales price. Windows is a registered trademark of Microsoft. Day-Timer is a registered trademark and Day-Timer Organizer is a trademark of Day-Timers, Inc.

Circle 80 on reader service card

The new Compaq Contura notebooks. Powerful DX4 processors as fast as 100MHz. Up to 720MB of storage capacity. A docking base that lets you use an external monitor, mouse and keyboard. All in one remarkably affordable, elegantly efficient little package. Finally, a line of notebooks that excel in the oddest of places. Like wherever you happen to be.



For more information on the Compaq Contura 420 and 430, call the Compaq [illegible] Center at 1-800-345 1518 and select the Paqfax option, or reach us on the Web at www.compaq.com. © 1995 Compaq Computer Corporation. All rights reserved. Compaq, Contura Registered U.S. Patent and Trademark office.

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With an optional docking base, you gain easy network access and connection to peripherals.

AFFORDABLE.

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Circle 88 on reader service card

clusions (Emma Goldman) are glaring and some inclusions (Sun Ra) surprising. But a Viewpoints feature sheds light on key interpretive debates. It allows quick cross-referencing and access to more than 300 primary documents through a variety of tools: time lines, atlases, hot text, the Idea Search, and the Infopilot browser. This multimedia resource yields notebooks, sound bites, slide shows, and movies—from footage of the Wright Brothers to the conflict in Bosnia. —*Derk Richardson*

- **Compton's Encyclopedia of American History** $59.95; Compton's New Media; 800/261-6109, 619/929-2500. Grade: B+

Reader service no. 743

SCIENCE IS FUN?

A mass of hardened goo washes up on shore. Alarmed beach rangers call the science patrol. The only way to be sure the beach is safe is to identify the blob. That's one of two science mysteries in Science Sleuths Volume 1, an advanced puzzler for kids ages 12 and up. Solving the puzzle means using scientific method—observation, hypothesis, and experimentation. An array of scientific tools, from a graduated cylinder to a gas chromatograph, give you what you need to solve this geological mystery. Even Beekman and Jax couldn't have a better lab setup. Volume 2 expands the model started with the beach blob mystery with two new mysteries: The Biogene Picnic and The Traffic Accident. —*Peter Scisco*

- **Science Sleuths Volume 1** $59.95; **Volume 2** $59.95; Videodiscovery; 800/548-3472, 206/285-5400. Grade: A

Reader service no. 744

Good, clean fun in the Blockbuster Movie Guide

IN THE KITCHEN WITH JULIA

Everyone knows that when Julia Child is slinging the pots, dinner'll be worth eating. Invite Alice Waters, Jeremiah Tower, Jacques Pepin, and 13 other culinary stars to join her, and you get Julia Child: Home Cooking With Master Chefs. This disc compiles over 100 beautifully photographed dishes. The guest chefs (with occasional bubbly asides from Julia) narrate 25 short cooking lessons that demonstrate how to prepare some signature items. This is an entertaining, artfully presented bag of culinary tricks that should appeal to anyone with an adventuresome palate. —*Peggy Nauts*

- **Julia Child: Home Cooking With Master Chefs** $39.95; Microsoft; 800/426-9400. Grade: A

Reader service no. 745

The Home PC Scorecard

When you buy a computer for your home, you want a fast, reliable machine that fits your budget, works out of the box, runs all your multimedia software, and is backed by great service. This month's Home PC Scorecard takes a look at four new systems and rates how they meet your needs. Let us know what's most important to you when you look for a home computer and what you've experienced after purchasing one. Send E-mail to home@pcworld.com.

		Overall grade	List price (25%)	Performance rating (20%)	Multimedia compatibility (10%)	Setup (15%)	Reliability (15%)	Service (15%)	Reader service number
Compaq Presario CDTV 978 800/345-1518	Compaq's service and reliability scores—as well as stellar multimedia compatibility—land this system a decent grade. But its performance is slow for a Pentium-75, and the price is high.	B	$2598	67	A	B+	A	A	761
Gateway 2000 P5-100 Family PC 800/846-2000, 605/232-2000	Gateway improved its setup instructions, but there's still no friendly interface to teach your family the basics. This Pentium-100 is fast and comes with lots of fun software, a 28.8-kbps modem, and a 4X three-disc CD-ROM drive.	C+	$2724	80	C+	C+	C	C	762
AcerAcros Multimedia P-75 800/733-2237	Acer supplies clear setup instructions, but the Computer Explorer interface doesn't do much to help novices. Comes with nifty software demos. Don't ignore those service and reliability grades, though.	C+	$2315	67	B	B	C	D	763
USA Flex Custom PT-90 Multimedia System 800/872-3539, 708/351-9700	An easy out-of-box experience on this strong performer. But if you need a PC tutor, you won't find one here. You will find 22 software packages and enough hardware for your home office.	C+	$2599	78	A	B	[1]	[1]	629

[1] Insufficient customer responses to our Reliability and Service Monitor to gauge service performance and reliability. For our overall evaluation, we use an average rating derived from all companies for which we have received fewer than 100 responses.

Methodology To determine the performance rating, we put the systems through the same tests we use for the Top 20 system review, plus two multimedia tests, the Providenza and Boekelheide Mediastones video benchmark and a CD-ROM performance test. Because of the additional multimedia testing, a system's performance index may vary slightly from the index shown in the Top 20. For the multimedia compatibility grade, we installed and ran a series of popular CD-ROMs. For user experience, we give high marks for clear assembly instructions, well-marked components, and a hardware design that makes getting started effortless. Extra points are given for user interfaces that help novices. Service and reliability grades are based on results from the PC World Reliability and Service Monitor. The overall grade combines the weighted category scores and a price rating.

For more information about all products in this table, circle reader service no. 908.

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Model	Description	Colors	LCD Panel *(glass size)*	Weight	Video Projection
*n*VIEW Z SERIES 110/115	Innovative panels	1.4 million	8.4 inch	4.3 lbs.	115
*n*VIEW Z SERIES 210/215	Breakthrough panels	16.7 million	10.4 inch	5.0 lbs.	215
*n*VIEW GRAPHX Z310	Quality XGA panel	1.4 million	10.4 inch	5.0 lbs.	Optioal adapter
*n*VIEW Presenter 101	NEW low-cost panel	185,144	8.4 inch	4.1 lbs.	Optional adapter

1-800-*n*VIEW-51

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A RECIPE FOR HOPE

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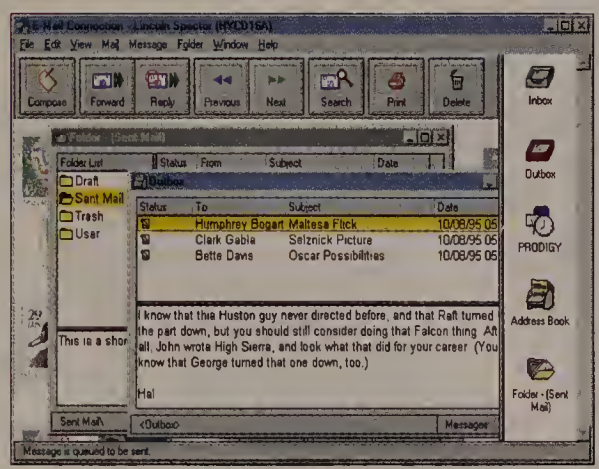
It's in the Mail

Internet E-mail is the cheap way to get online.

BY LINCOLN SPECTOR

If my mother had an Internet address, I'd write to her more often. And if *you* had an Internet address, you could write to my mother, too. Or better yet, you could write to people you know.

Forget about TCP/IP, stacks, Archie, Veronica, and the weird wonders of the World Wide Web. With just an E-mail address on the Net, you can keep in touch with friends and family, read government documents (alas, only the declassified kind), tell Bill Clinton and Newt Gingrich what you think, query academic databases, have David Letterman's Top Ten Lists delivered to your computer, and let the editors of *PC World* know that *House Calls* is the best part of the magazine.



Writing letters offline saves money.

And E-mail is much cheaper than full Internet access. Ask yourself this question: At the same hourly rate, does it cost more to upload mail you've already written and download mail to read later, or to wait for a Web browser to find a page somewhere in the world that's probably the wrong page anyway? If you can't figure that one out, forget about *PC World* and start reading *Remedial Math Digest*.

GETTING A MAILBOX

The simplest way to get a mailbox, and one of the cheapest, is through an online service. These services offer more than E-mail, of course (for full details see "Best Online Services," June 1995), but if E-mail is your top priority, CompuServe, Prodigy, and America Online will all do quite nicely. Their rates are identical: $9.95 a month, plus $2.95 an hour after the first 5 hours. If you do your reading and writing offline, you can handle all your E-mail easily in 5 hours.

Of course, the key is to do all your reading and writing offline. All three services have software that will dial the service, give it your password, upload the messages in your local out-box, download new messages to your local in-box, then hang up.

AOL's standard front-end software can run something called FlashSessions to get you on and off quickly. To set it up, select *Mail•FlashSessions* while offline. The software will walk you through it from there.

How to do the job on CompuServe depends on which front end you use. With WinCim, select *Send/Receive All Mail* to upload whatever's in your out-box and download new mail to your in-box.

On Prodigy, offline reading and writing requires a special $19.95 version of ConnectSoft's excellent mail program, the E-Mail Connection (why do I hear Kermit the Frog singing that?). Jump to **e-mail connection** to order the software.

E-MAIL ONLY

Friends & Family Mail (F&FM)—a variation on MCI Mail targeted at home use—also uses a special version of E-Mail Connection for its front end. The great thing about this E-mail–only service is that there are no online charges, which means that you don't pay a red cent to receive mail. The monthly fee is only $5, and the first ten messages you send every month are free, as long as each of those messages is shorter than 10,000 characters (more than twice the length of this column).

But if you send a lot of E-mail, watch out. Each additional message costs at least 25 cents—long messages cost more. After about 40 messages a month, you'll be paying far more than you would elsewhere. On the other hand, if you get on a lot of mailing lists and receive more messages than you send, F&FM could be the cheapest alternative.

There, I did it. I wrote an entire column about Internet access without once using the words *information superhighway*—oops.

- **America Online** $9.95 a month for up to 5 hours, $2.95 per hour thereafter; 800/827-6364
  Reader service no. 723
- **CompuServe** $9.95 a month for up to 5 hours, $2.95 per hour thereafter; 800/848-8199
  Reader service no. 724
- **Friends & Family Mail** $14.95 one-time setup charge, $5 a month (waived for MCI long-distance customers), includes ten messages of up to 10,000 characters each, 25 cents per 10,000 characters of each message after that; 800/624-9862
  Reader service no. 725
- **Prodigy** $9.95 a month for up to 5 hours, $2.95 per hour thereafter; 800/776-3449
  Reader service no. 726

Lincoln Spector is a PC World *senior associate editor.*

HELP YOURSELF

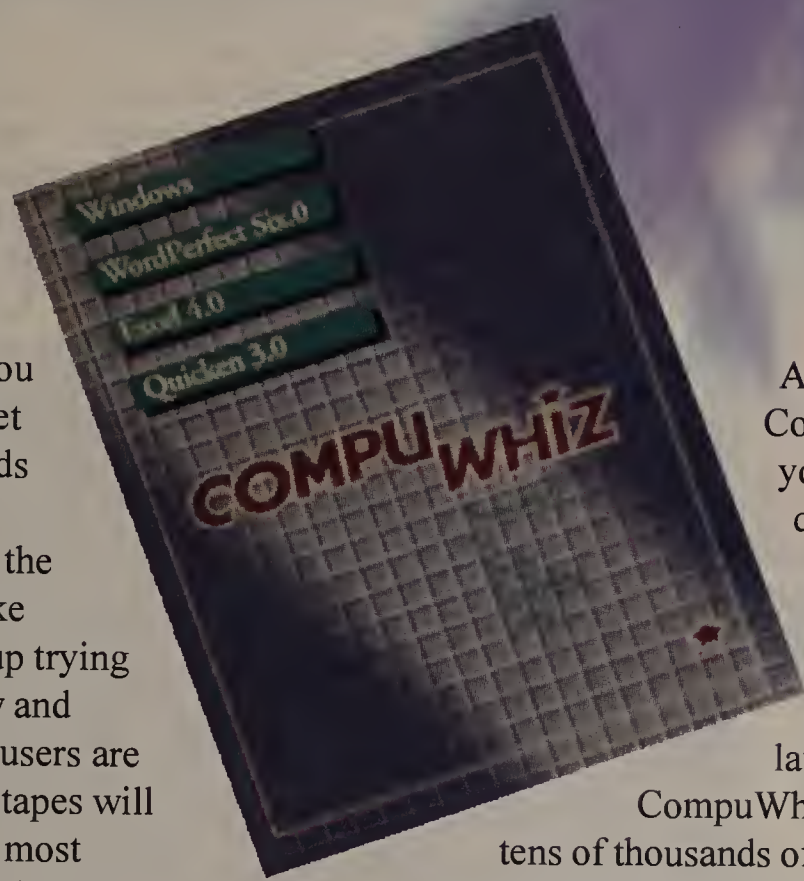
WHAT'S YOUR ADDRESS?

If you have an AOL, CompuServe, Friends & Family Mail, or Prodigy account, you've got an Internet address you can hand out at parties. Here's how to figure out what it is:

AOL: ***yourscreenname*@aol.com**
CompuServe: ***your.number*@compuserve.com**
(Note that you must replace the comma in your number with a period.)
MCI Friends & Family Mail: ***idnumber*@mcimail.com**
Prodigy: ***userid*@prodigy.com**

CHIP WASS

All your answers are in this box.



Ask yourself one question. Are you getting everything you need out of your computer? If the answer is no, you are not alone. Most people get by with a few basic commands and a lot of mistakes. Most people don't have the time or the energy to read manuals or take classes. Many people give up trying to use their computers in new and exciting ways. CompuWhiz users are different. CompuWhiz videotapes will show you how to operate the most popular software programs in just a few hours. Our videotapes were created by software training experts with recommendations from users like yourself. And the quick reference guide gives you the ability to watch only the parts you need. For only $99.95 CompuWhiz includes four instructional videos covering Windows, Excel, Wordperfect, and Quicken.

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Computerus Interruptus

Watch out! There's some really lousy software out there.

BY STEVE BASS

If there's one thing I've learned writing *Home Office*, it's this: A great many programs and peripherals are designed by idiots. For every product I praise in print, I have to sift through dozens of others, some so monumentally awful that I risk loss of data, a trashed system, and stress-related injuries—like a concussion from banging my head on the desk—every time I install one.

For instance, there are programs that put their own files in your Windows directories, then don't clean up after themselves—a popular and complementary set of bad habits. It seems as if developers just naturally assume that your \windows and \windows\system directories are their own private playpens, and that you'll never, ever want to remove their masterpieces. Multimedia CD-ROMs are the worst: Microsoft's Encarta dumped 3MB of files where I can't easily remove them.

I've griped about this before, and I guess it's done some good, since uninstall routines are now merely rare instead of unheard of, and may soon be common. In the meantime, buy a copy of MicroHelp's UnInstaller 3. It's a little slow, but it does an exquisite job of removing Windows applications. Best of all, it checks my .dll files against my .exe files and figures out which can be safely deleted.

Have you noticed all the programs that overwrite the current version of an existing .dll with an older one, or insist on putting yet another copy of vbrun300.dll or ctl3d.dll—support files that many programs require—onto your hard disk? I've got a copy of ctl3d.dll in my SideKick, Quicken, Font Monster, and Creative Labs sound card directories, among other scattered locations. And I can't sell them at a garage sale.

Speaking of insane installations, try Adobe Acrobat Reader 2.0, the free program for reading Acrobat files. After this gem installs, it insists on restarting Windows—no options, no choices, and no way to save files or quit programs. Swell.

ONCE YOU'VE GOT IT GOING

Irritating habits don't stop when you've installed a program, either. Books That Work's Home Survival Toolkit CD-ROM actually comes with advertising—for an assortment of electric drills, saws, paint, and other sundry items—built right into the program. What's next, celebrity endorsements?

It's painful to admit it, but some products I've given glowing reviews to begin to look less than perfect after a few months' use. Visioneer's PaperPort scanner is a good example: I love the product, use it every day, and wouldn't give it up. But, boy, it could use better software. For instance, to convert a scanned document into a WinWord file, I merely drag it over to the WinWord icon. Cool? Very. But for every document I drag over, up comes another WinWord session until my system rolls over and dies. Not so cool.

Then there are products that say, "Just plug it into an existing port." Have they noticed that most systems come with only one parallel port and maybe two serial ports? Yet the PaperPort, Traveling Software's LapLink, Co-Star's LabelWriter II Plus, and many others all want a port they can call their own. I've cheated the system with Star Gate's One Slot, a board that has four serial ports (using fast 16550 UARTs) and three parallel ports. You'll need to crack the system case to install the board, and it's expensive—about $215 on the street—but it's worth every penny.

It sure feels good getting all that off my chest. How about you? Let me know if something in computing ticks you off. I'm on PC World Online almost every day and can also be reached at **steve_bass@pcworld.com**.

- **One Slot** $249; Star Gate Technologies; 800/782-7428, 216/349-1860, 216/349-2056 (fax)
  Reader service no. 728
- **PaperPort 2.0** $399; Visioneer; 800/787-7007, 415/493-0399 (fax)
  Reader service no. 729
- **UnInstaller 3** $79.95; MicroHelp; 800/922-3383, 404/516-0899, 404/516-6454 (fax)
  Reader service no. 730

Contributing Editor Steve Bass is a licensed marriage and family therapist and president of the Pasadena IBM Users Group. He can be reached on PC World Online. See page 12 for contact information.

TALK TO US: You can E-mail the editors of the PC World @Home section at home@pcworld.com, and write to us at 501 Second St. #600, San Francisco, CA 94107. We're eager to hear your responses and opinions about any topic related to home computing.

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°The VeriTest Cross-Country v2.0 test simulates typical executive use of Microsoft Office® applications in Microsoft Windows® 3.11 during an airplane flight. Power management was enabled and 8MB RAM was installed. VeriTest, inc. is located in Santa Monica, CA. Promotional pricing is not discountable.

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